



**Egypt**



**Rome**

**They got nothin' on us.**



**Greece**

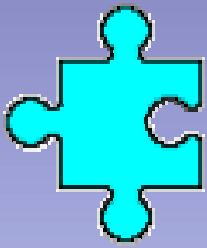


**Babylon**

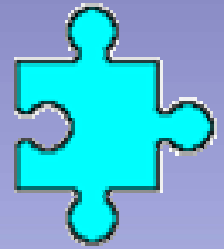


# *Lost Civilizations*

**The Puzzle of the Manteño-Huancavilca**

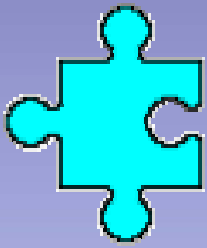


# *The First Puzzle Piece*

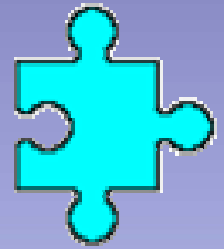


- Manteño lived along coast of Ecuador (700 – 1542 AD)
- Vast trading empire
- Conquered local peoples through economics

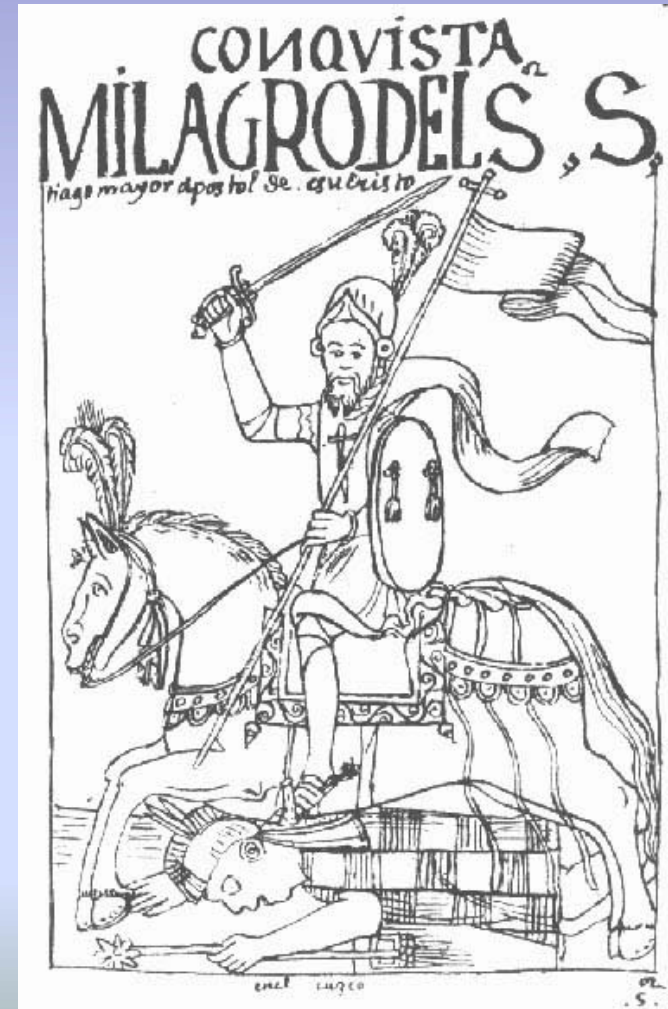




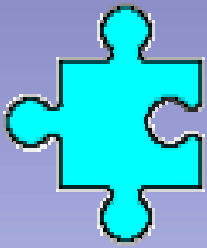
# *Enter the Spanish*



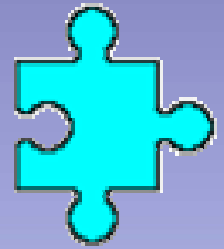
- Pizzaro conquered in 1542
- Arrived in **Port of Chanduy** near Loma de los Cangrejitos
- Destroyed nearly everything → almost nothing left of Manteño civilization





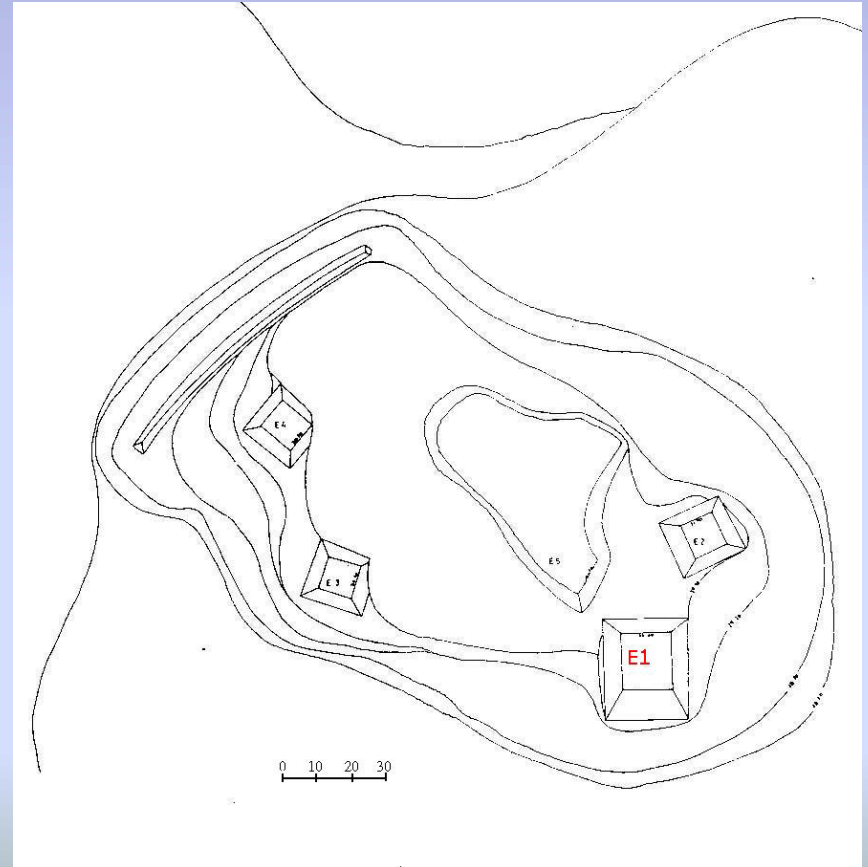


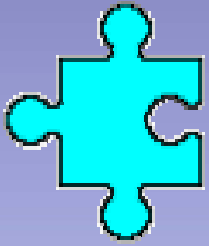
# *Exit the Spanish; Enter Archaeologists!*



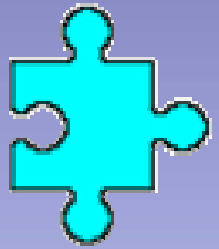
(that's us!)

- Manteño left behind platforms on Loma de Los Cangrejitos
- Cemetery nearby was pillaged, but platforms largely ignored
- If platform use was known, can give us insight into lost culture
- However, no visible artifacts





## *Our Hypothesis*

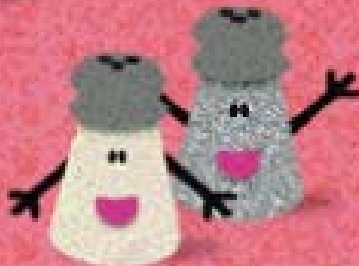


- We thought that the platforms were used as living spaces. Therefore no artifacts were found because the house floors were swept clean.
- Our associated assumption was that even if the floors were swept, we would still be able to detect micro-artifacts.

*But we need some help...*

# Archaeology!

(Blue's Clues Style)





# Archaeology - Some Basic Terms

- **Archaeology:** study of human past
- **Archaeometry:** specific branch of archaeology
- **Artifact:** human-made or altered objects
- **Provenience:** context
- **Matrix:** level or layer

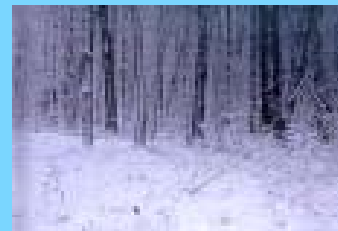




The things we are looking for are thousands of years old. How come they are still around?

## Preservation of Organic Materials:

- Dry Environments
- Cold Environments
- Waterlogged Environments





Let's look for some clues!

But we need our...HANDY DANDY  
NOTEBOOKS!

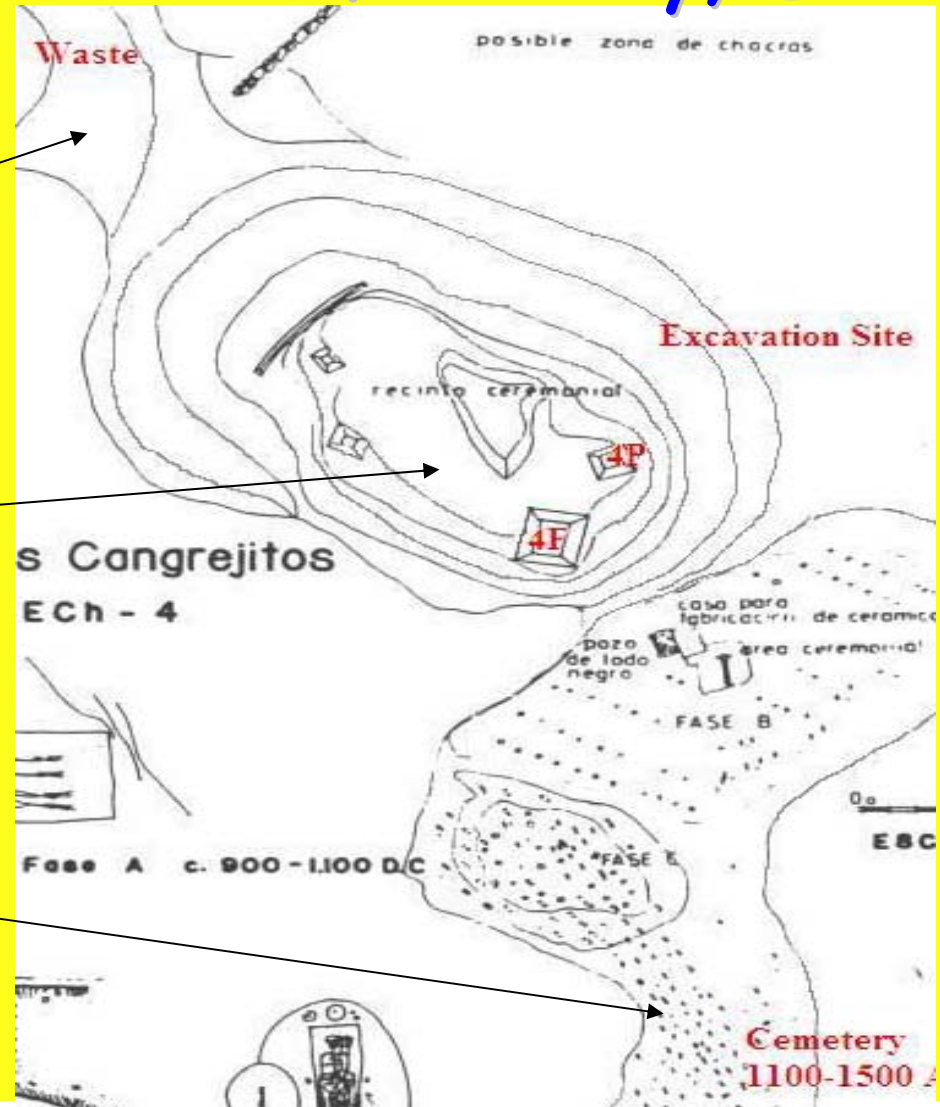
# Where can we find clues?

Excavation Site - Near Port of Chanduy, Ecuador

- Low, uneven mounds

- Crab Hill

- Ancient Cemetery



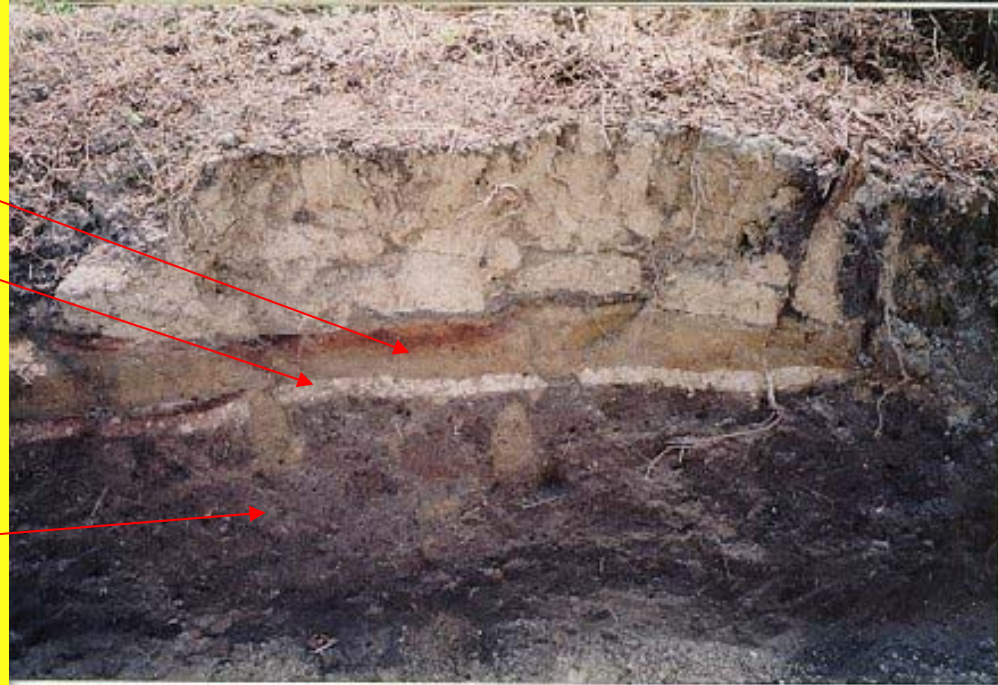


# Where can we find clues?

Matrix 4

Matrix 5

Matrix 6



# How can we find clues?



Hubbard Sieves and size fractions:  
Easier to focus on one size particle



# How can we find clues?

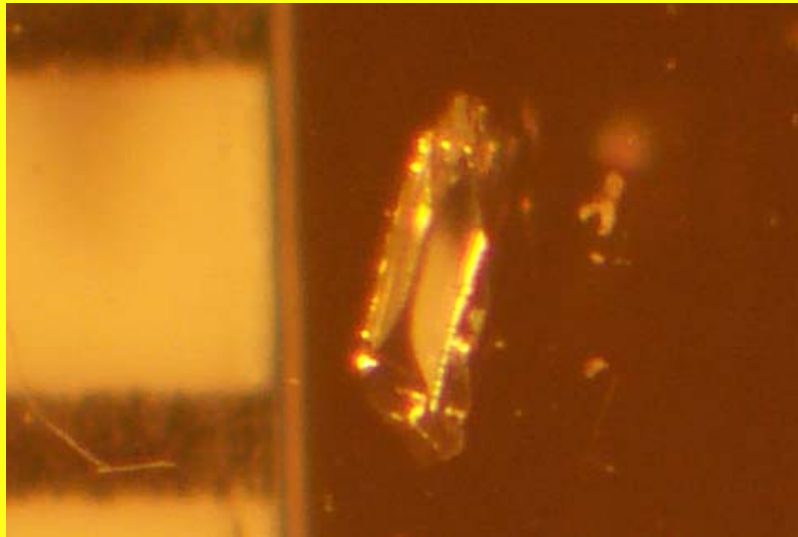


SEM vs. light microscope:

- Samples initially examined under light microscope
- Potential finds brought to SEM

# How can we find clues?

How do we know that this is really a piece of obsidian?



Experimental archaeometry/type samples:  
Comparison of our finds to controls

# How can we find clues?



Newly developed methods:

- Dissolving sample in water
- HCl reaction with  $\text{CaCO}_3$





**It's MAIL TIME!**





Let's skiddoo to Dr.  
Miyamoto's Lab!

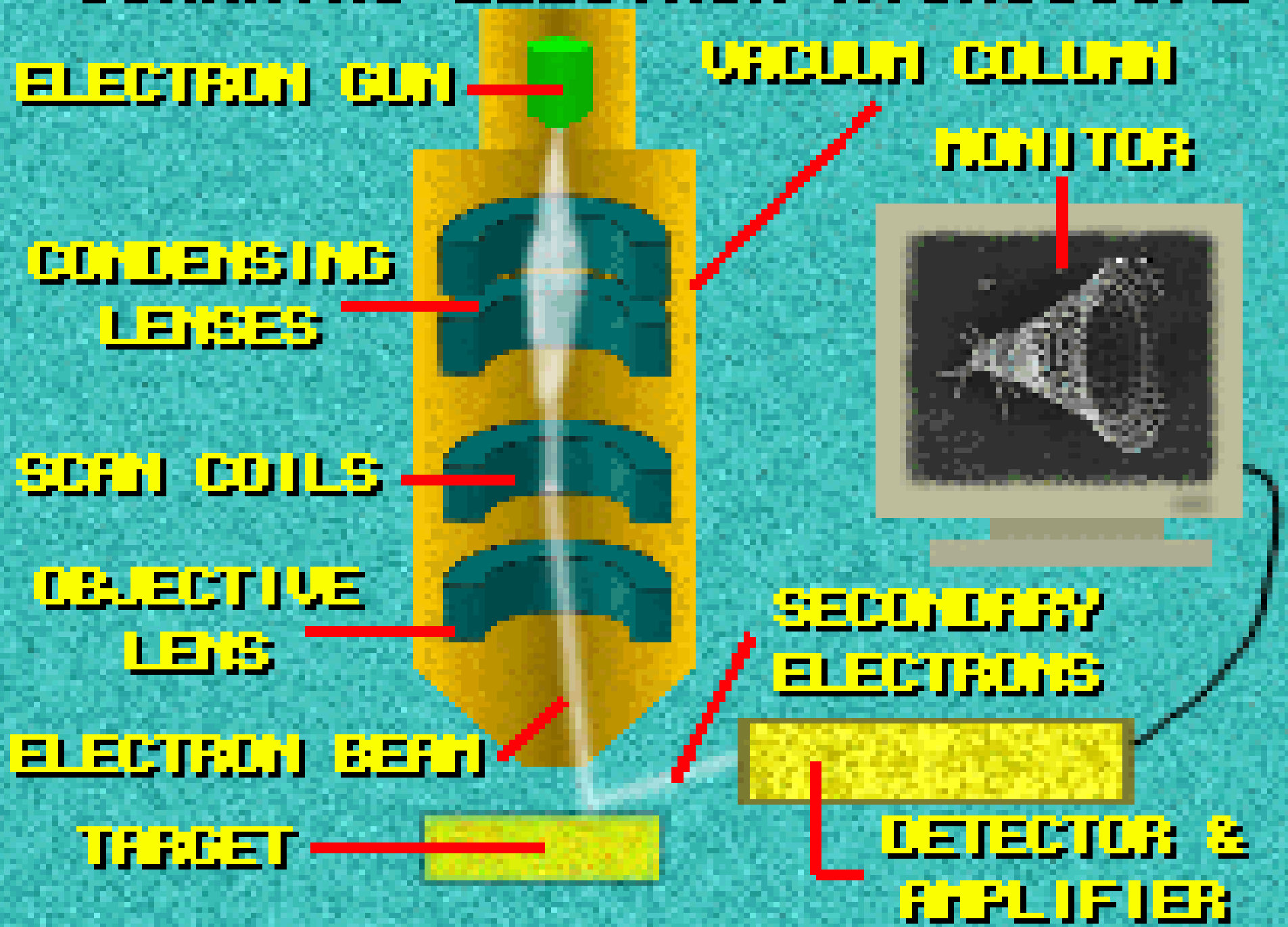




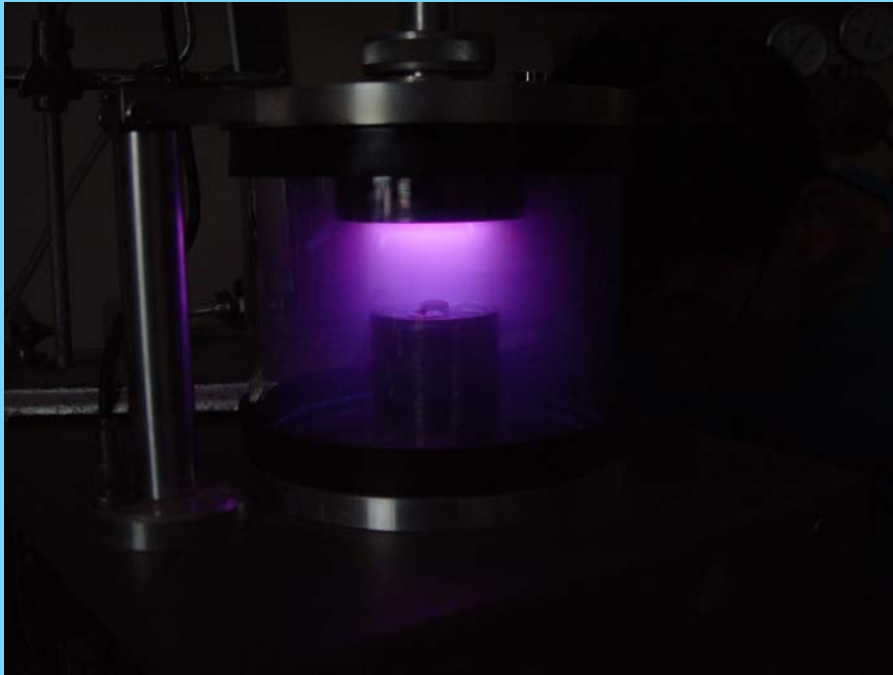
**STEREOSCAN 440**



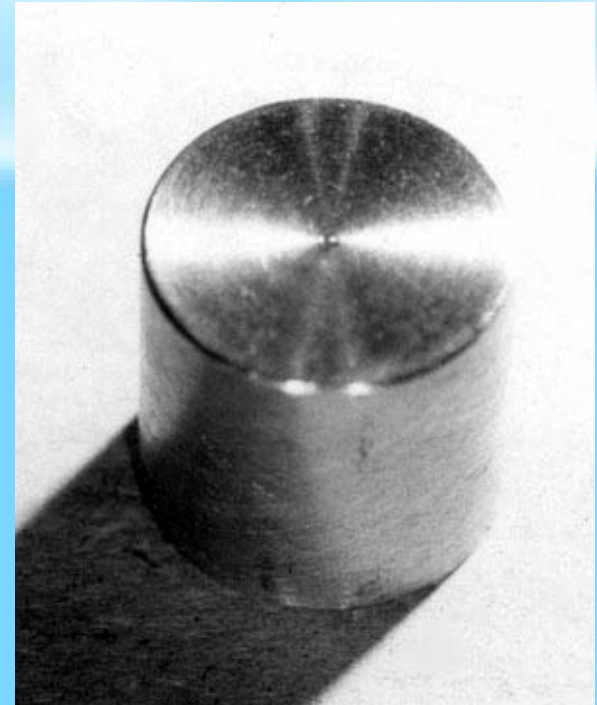
# SCANNING ELECTRON MICROSCOPE



# Scanning Electron Microscope



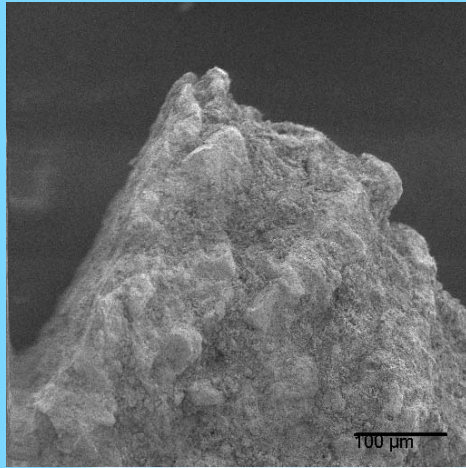
Sputter coater



Stub

- We used the SEM to compare unknown artifacts with known type samples in order to identify the objects.

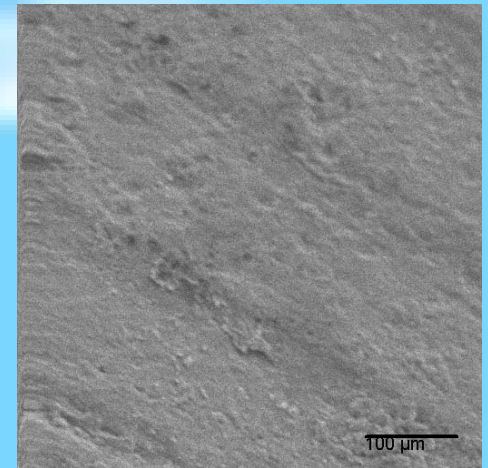
# Scanning Electron Microscope



38x



200x



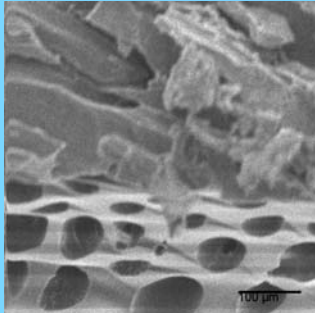
900x



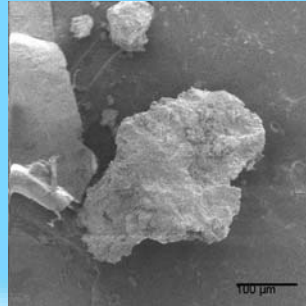
These things are so small! How do we know for sure what they are?

## Type Samples vs. Artifacts

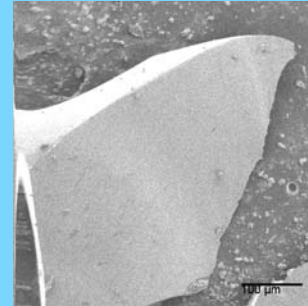
Wood Charcoal  
(900x magnification)



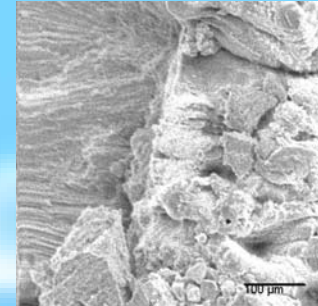
Ceramic  
(37x)



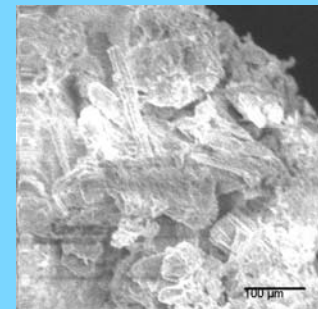
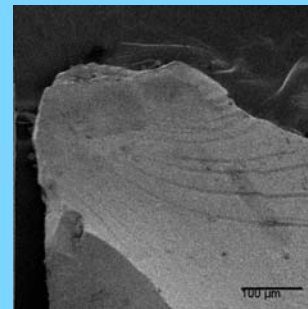
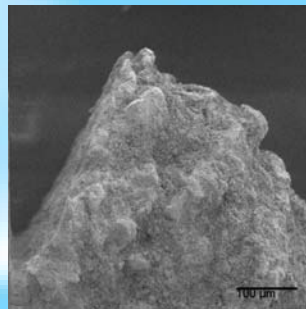
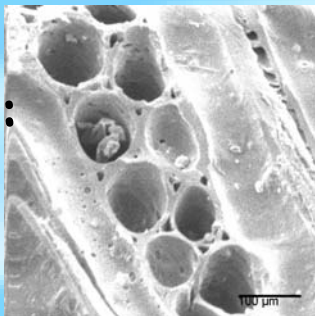
Obsidian  
(37x)



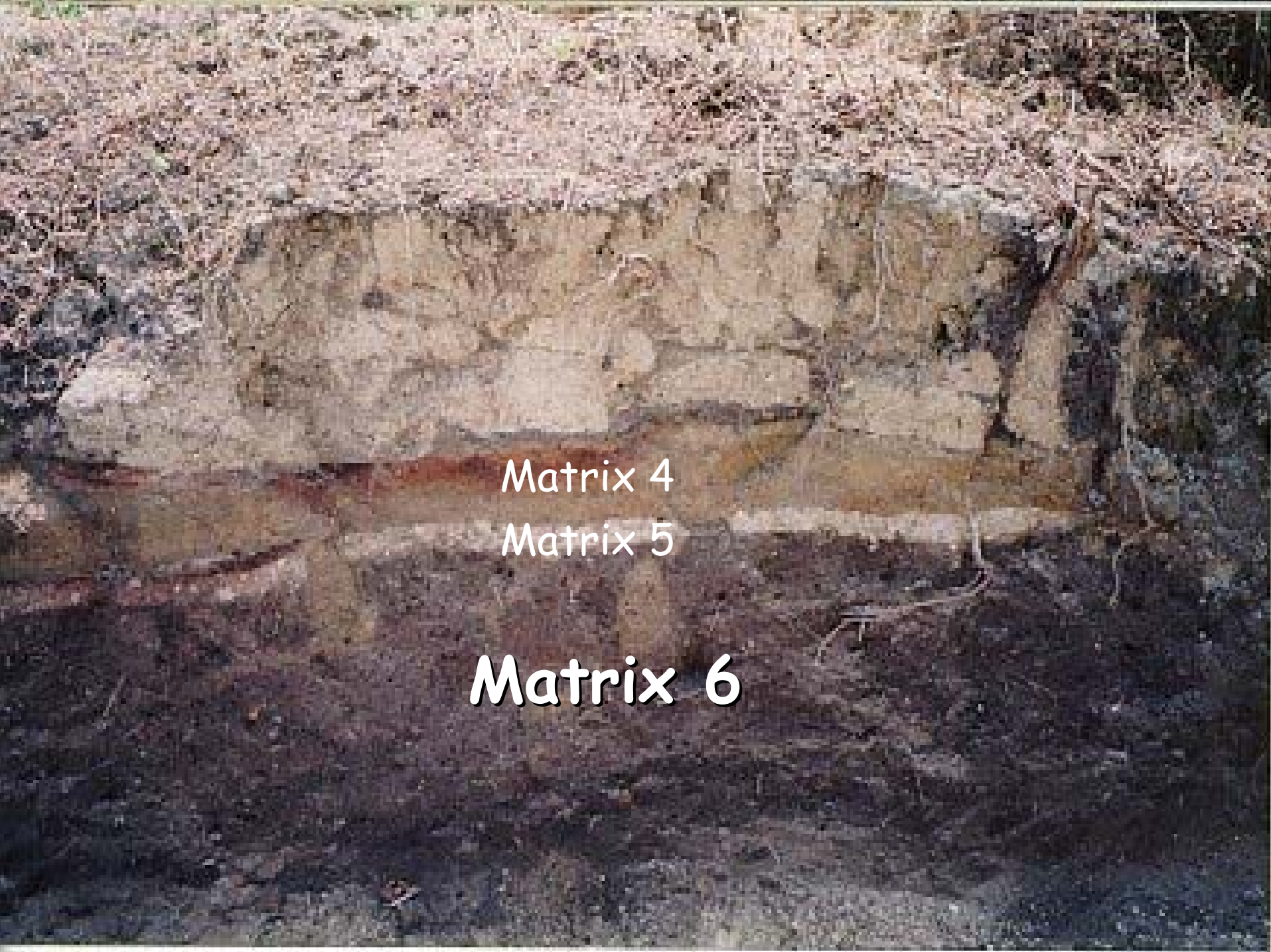
Spondylus Shell  
(900x)



Type  
Sample:



Artifact:



Matrix 4

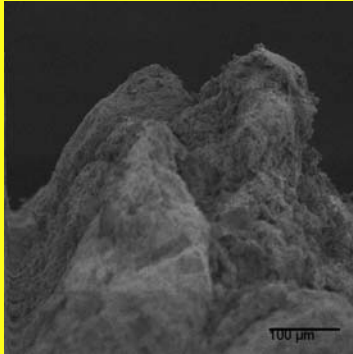
Matrix 5

**Matrix 6**

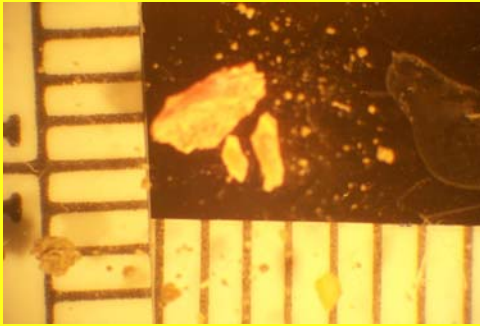


## Matrix 6

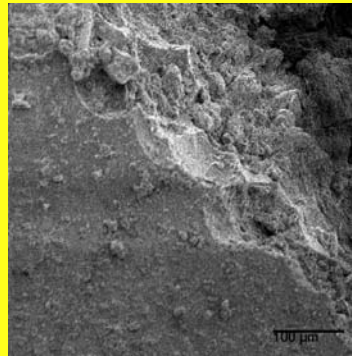
- Pottery scattered throughout matrix
- Contains ochre-red designs



Pottery (SEM) 200X



Spondylus (light microscope)



Shell Flakes (SEM) 200x

- Color ranges: purple, orange, red
- Rare and valuable
- Used to make beads



Bone (light

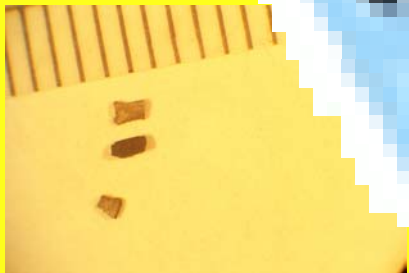


ear.

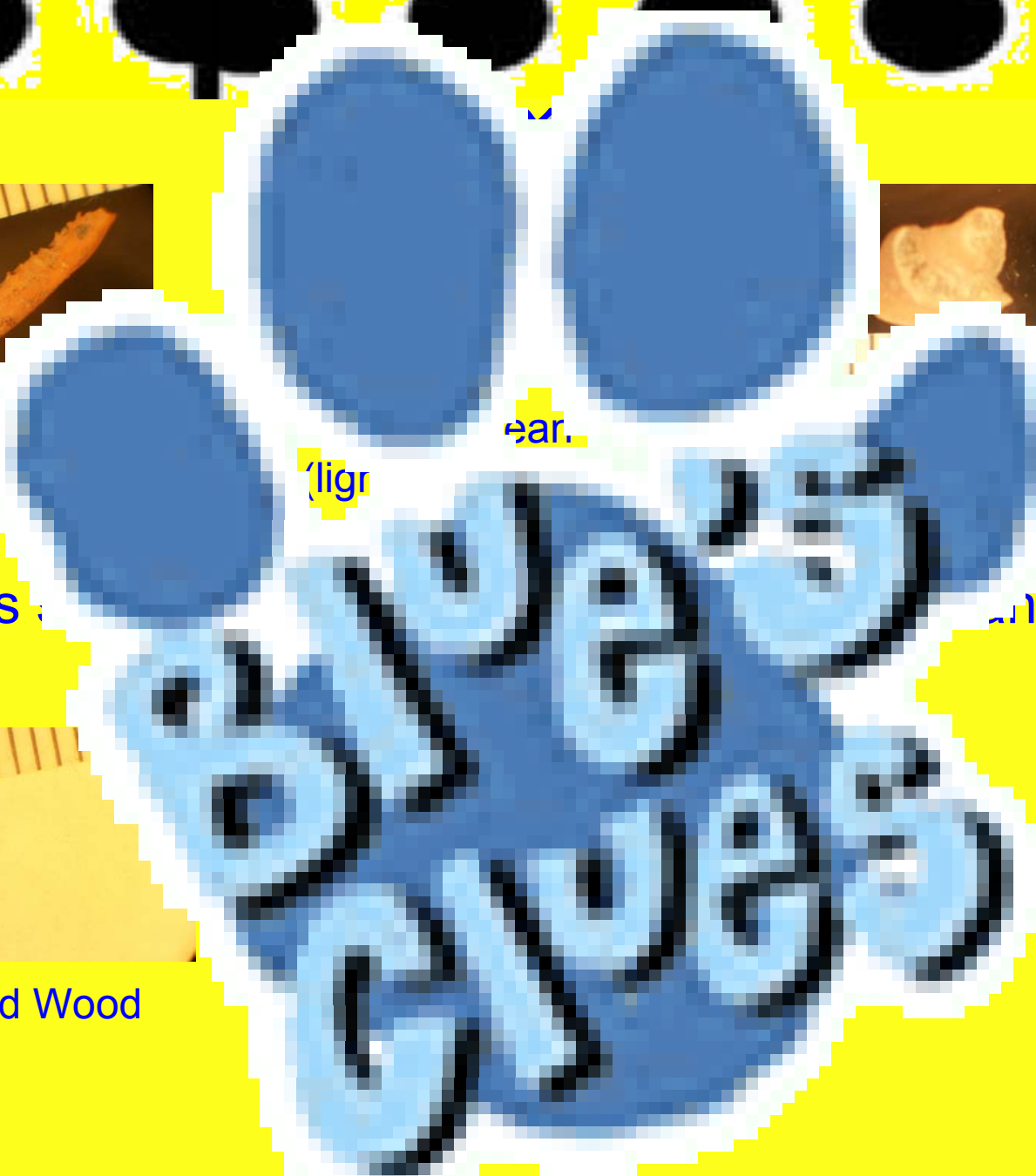
's fish  
earing"  
ope)

an, birds

•Diet includes



Charred Wood





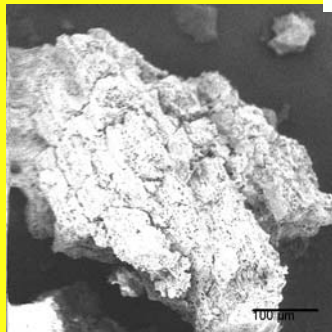
Matrix 4

**Matrix 5**

Matrix 6



Spondylium  
(light micrograph)



Charred Wood  
(SEM) 900x



carbonate

artifacts

charred

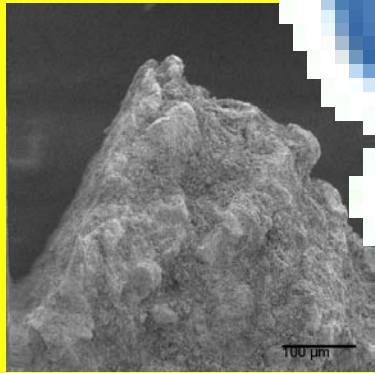
small amounts of  
artifacts



**Matrix 4**

Matrix 5

Matrix 6



Ceramic  
(SEM) 37x

1

Also found: obsidian (small amount)  
smooth stone (small amount)

er = most recent

artifacts

coal

units of

5

built up

vide





How do we know we found all the micro artifacts in our samples?

## Recovery Rate:

- Certain number poppy seeds per size fraction
- Calculated percentage recovered
- 40-50% considered acceptable
- 80% considered exceptional



Matrix	Recovery Rate
6	82.9%
5	81.25
4	84.51

Now that we've collected all the clues, it's time for our...





# Thinking Chair!



# Conclusion

- Not much is known about Manteño
- Artifacts found provide clues
- Matrix 6
  - 700 - 900 AD
  - Remains of variety of domestic activities
- Manteño's arrival
  - Approximately 1000 AD
  - Used economic prowess to conquer people
  - Built living surface (Matrix 5)

# Conclusion...Part 2

- Cemetery
  - Created at same time as mounds
  - Burial of leaders and wealthy individuals
- Other trash piles
  - Dates of use uncertain
  - Similarity of artifacts
    - Domestic activities continued after Manteño's arrival
- Matrix 4
  - Few artifacts found
  - Natural accumulated sediment



# Conclusion of the Conclusion

- Artifacts
  - Indications about lives and daily activities
  - Platforms' function changed after Manteño's arrival
- Possible uses of platforms
  - Ceremonial
  - Occupied by Manteño chiefs
- Can now create new hypotheses

# END CREDITS

Professor Masucci - Director

Jean Barmash - Cameraman

Cast and Crew:

Laurel, Christine, Kelsie, Julie,

John, Odie, Sharmin, Vani,

Debbie, Yu-Ann, and Jayme

SPECIAL THANKS to Dr.

Miyamoto, Blue, and Joe

# THE END!





**Just kidding!**

**It's NOT the end!**

**Congratulations,  
Professor! Good luck  
with your new baby!**