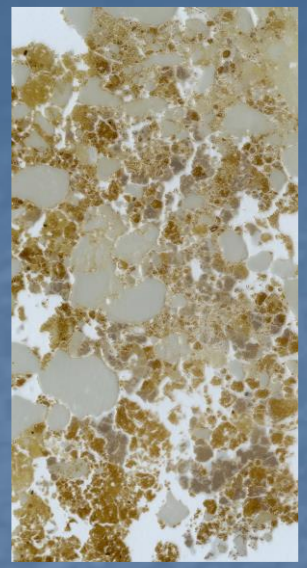
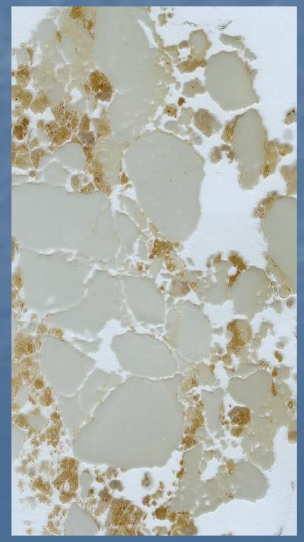
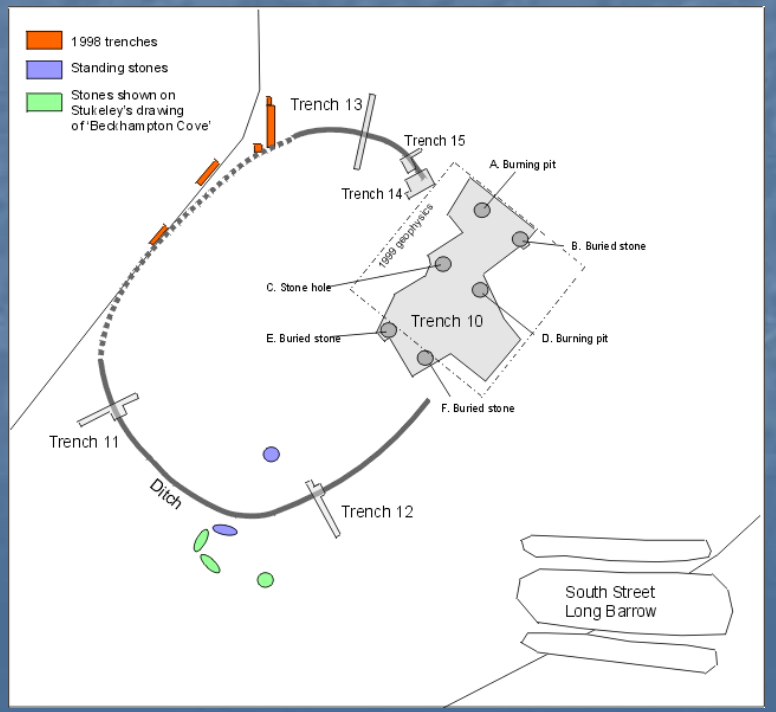
Case studies in geoarchaeology: understanding site and landscape from soils and sediments

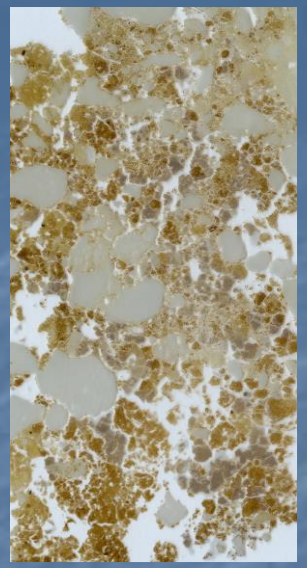
Dr Helen Lewis
UCD School of Archaeology





Fills of the Avebury Longstones Neolithic Enclosure ditch: typical Neolithic contexts: clean chalk backfill, ‘ritual’ deposit of topsoil, mixed chalk backfill





Rendzina stand-still horizon & earthworm sorted ditch fills from Avebury Longstones Enclosure

NATURAL OR CULTURAL?

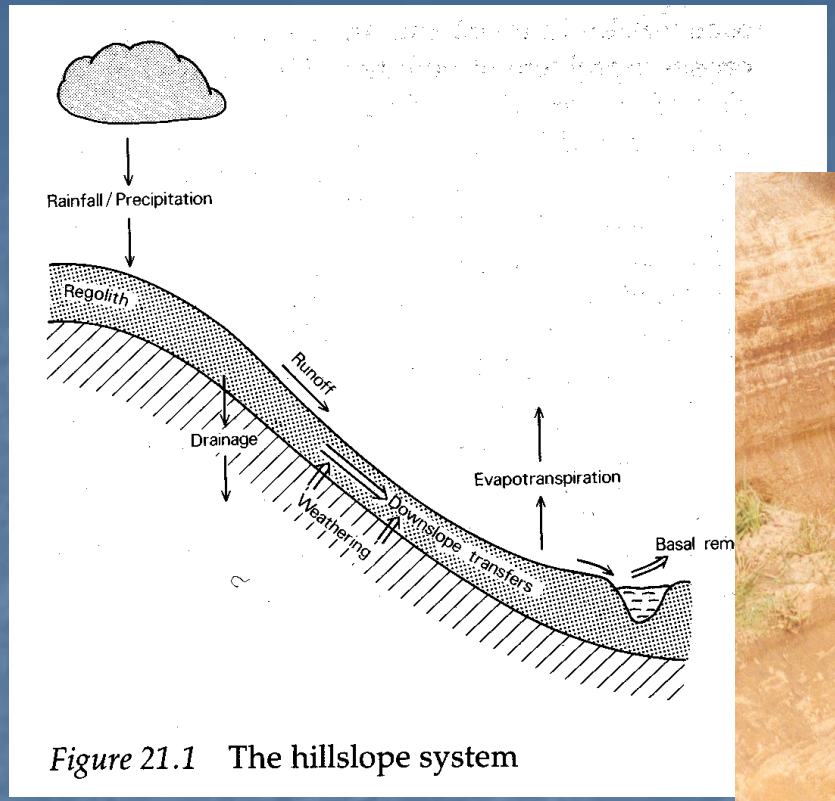
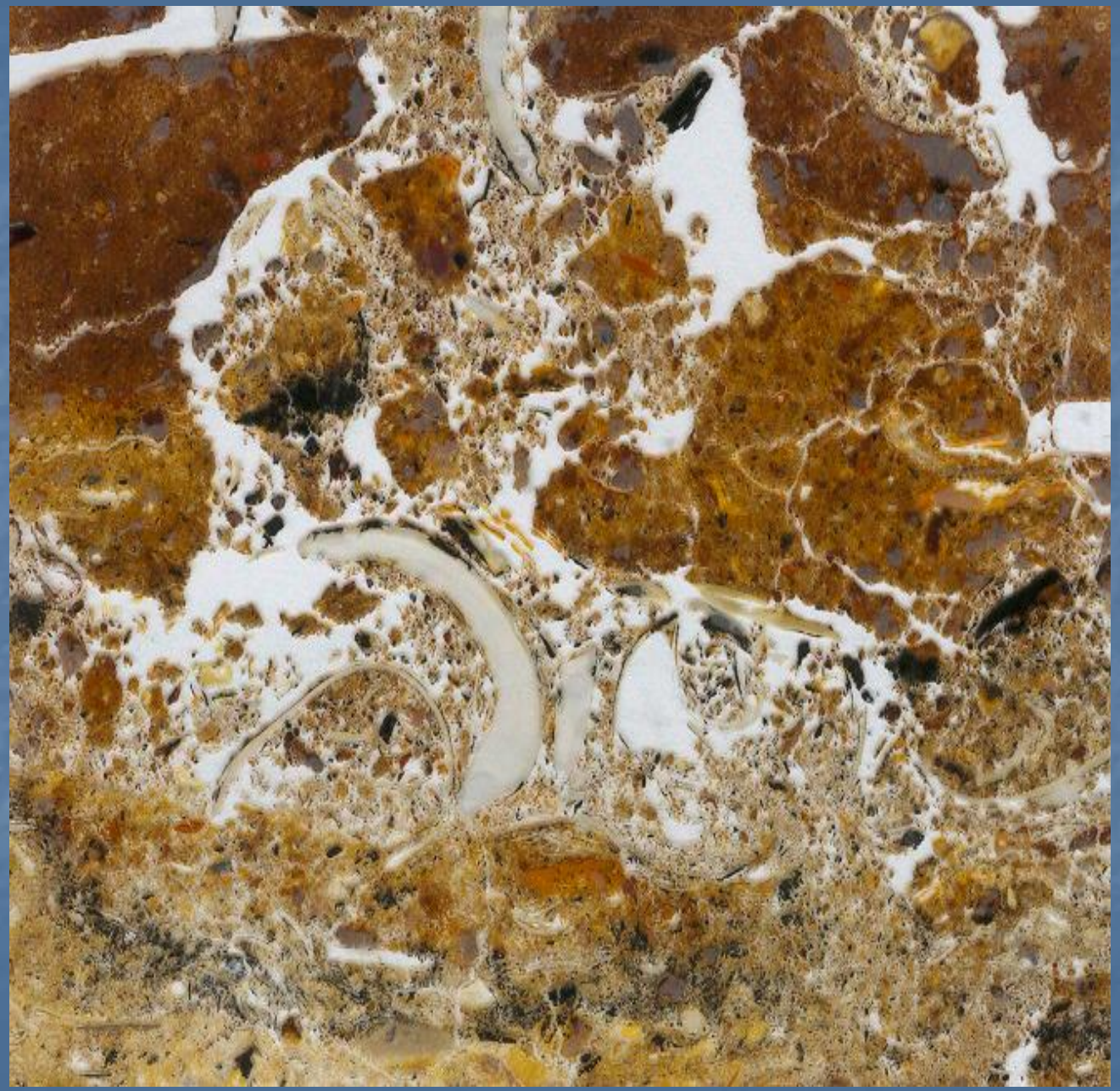


Figure 21.1 The hillslope system

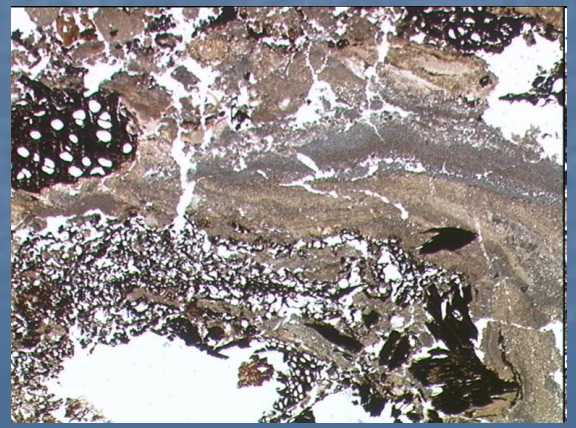
Kai Fechner is 6ft + tall – he is standing on the Roman old land surface, under almost 2m of colluvium created by historic ploughing and hillwash. The Roman surface includes plough marks, pottery scatters & pits. The wavy line above his head is a layer of post-Medieval pre-modern plough marks. There were no finds above the Roman layer. Kai only dug this deep because the TGV line required it.

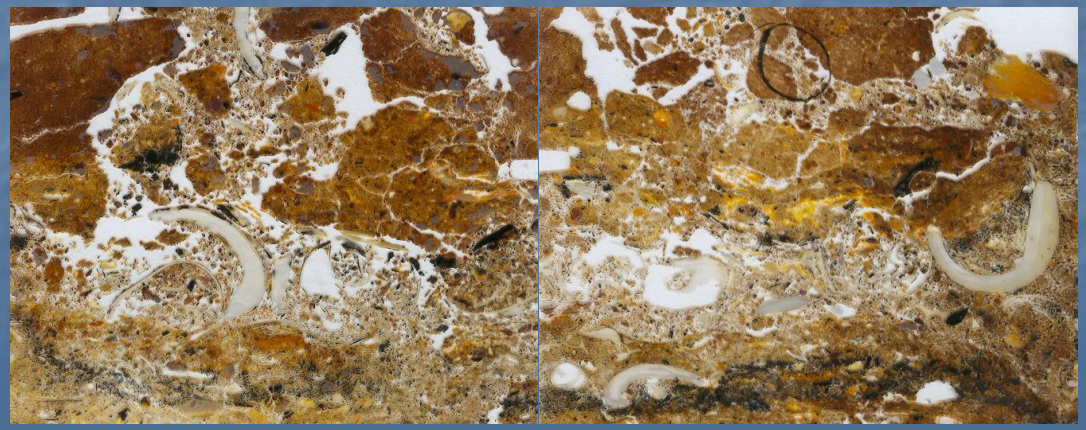
Niah Cave, Borneo

What is your interpretation of this?



Hearths, graves, food





Turf mound of Skelhøj BA round barrow – one of many coffin burial sites in S. Jutland, Denmark

Layers of sand & turf
Buried soil

Skelhøj BA round barrow – construction created anaerobic conditions; turves represent surrounding land use types & pre-barrow setting

- Turves from ploughed soils with shallow topsoil or only turf line

- Turves from thick wet pasture – mound core

- Turves from ploughed soils with shallow topsoil or only turf line

- Trampled turves & waterlain sand layers

- Buried soil with turf line and ard marks

Typical use of soil micromorphology on archaeological sites: 2) 'What is this' type of enquiries

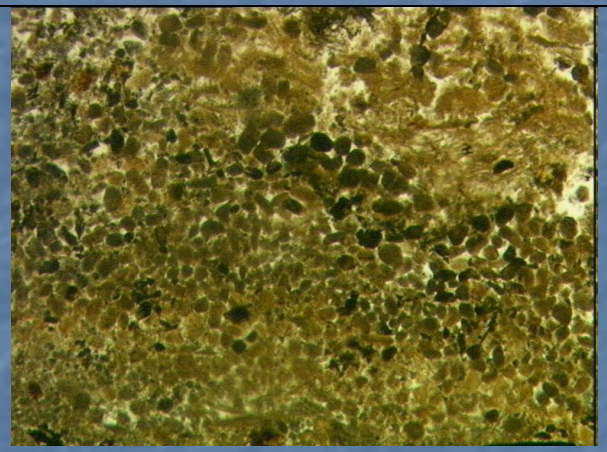
E.g. is this calcium carbonate (v. gypsum; v. other authogenic minerals)? Is it ash (i.e. is it cultural)?

The ashy guano: a riddle wrapped in a mystery…

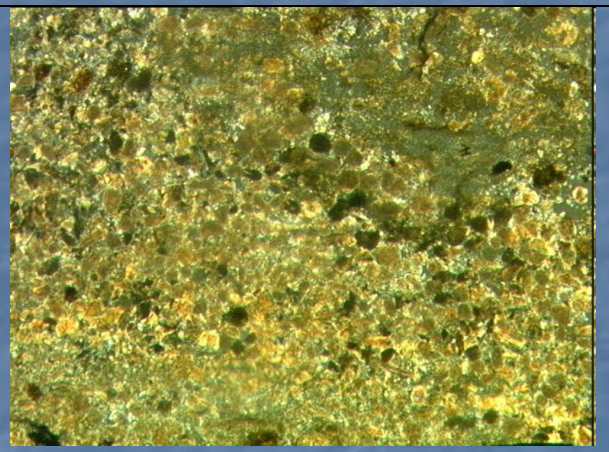
Niah 358 – Area B, ashy guano and ?surface 2072/2075

Niah 359 – Area B, ashy guano and yellow-brown

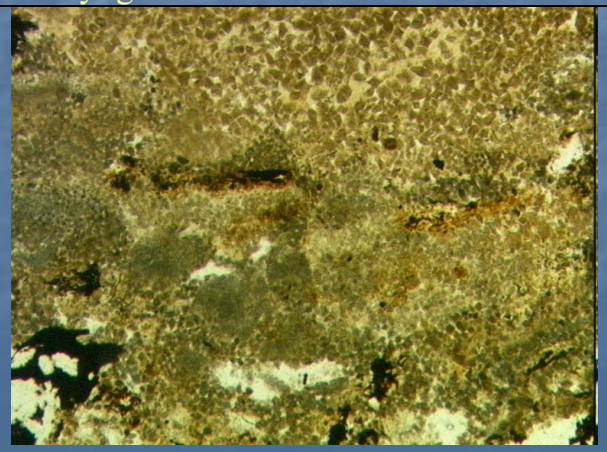
Niah West Mouth 'ashy' guano layer (upper pictures) and Traders' Cave modern wood ash (lower pictures) (frame width *c.*1200μm)



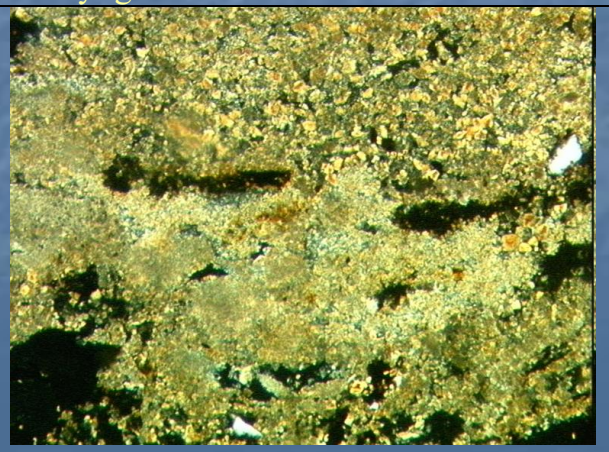
'Ashy' guano PPL



'Ashy' guano XPL

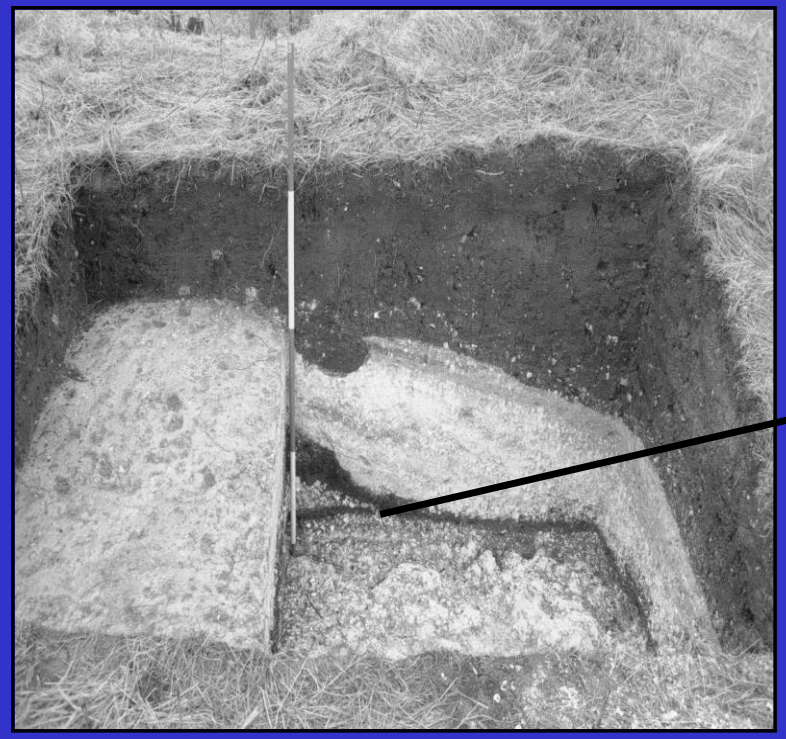


Recent ash PPL



Recent ash XPL

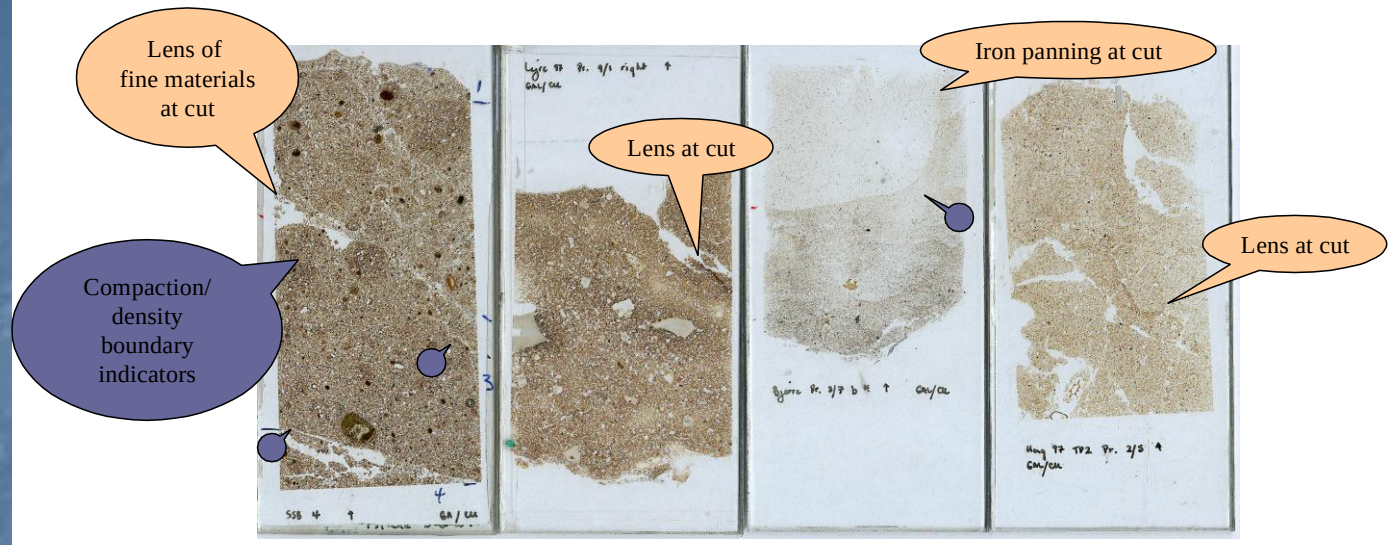
Is this a field?



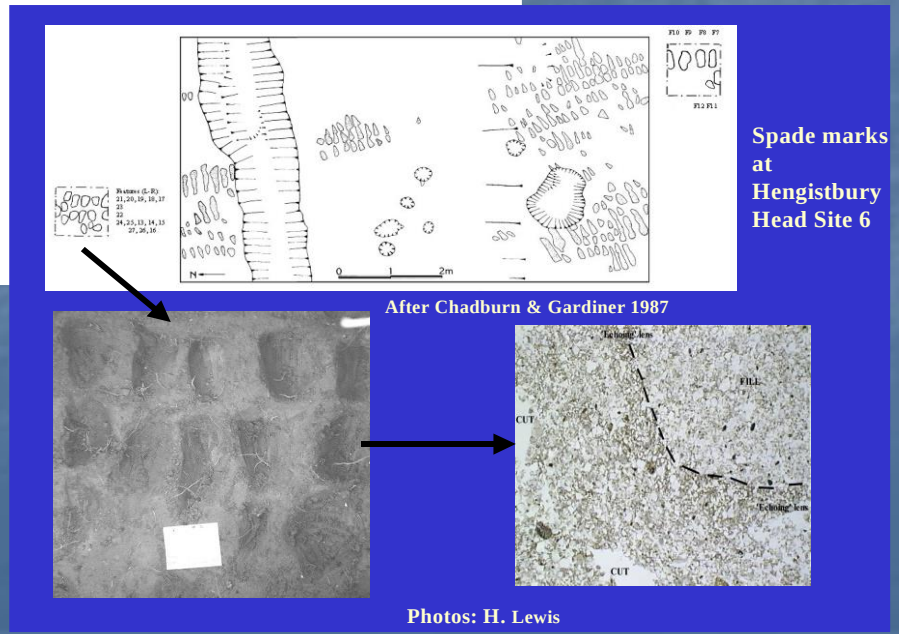
Wyke Down Project 1998

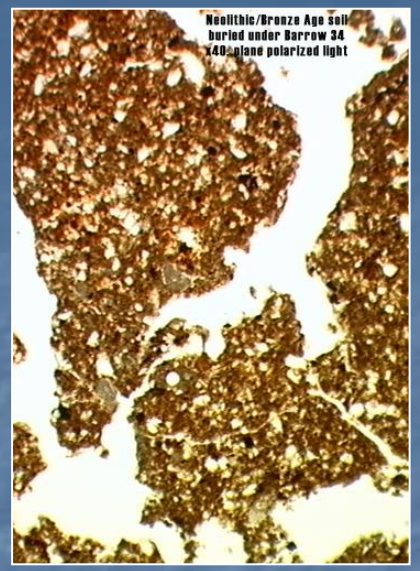
?

CHARACTERISING IMPLEMENT MARKS MICROMORPHOLOGICALLY

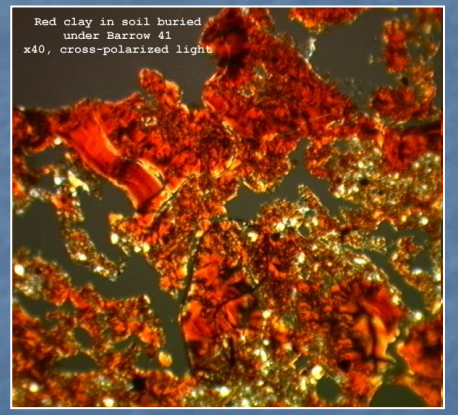


1. Experimental characteristics (lab)
2. Experimental characteristics (field)
3. Characteristics of very clear archaeological features
4. Characteristics of somewhat less clear archaeological features

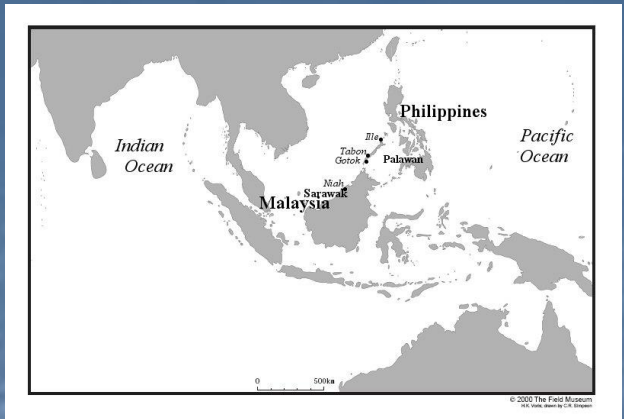


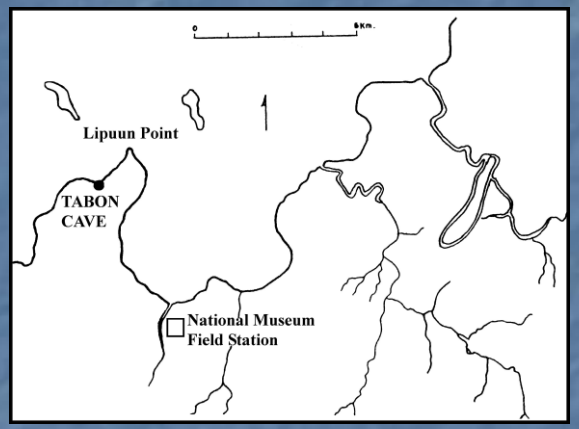


Soils buried under and found within archaeological monuments are widespread in the region, and form the main source of information for ancient land-use studies. Also, since they are found in and under monuments, their study can also address how land-uses were spatially and temporally related to monument construction The barrows examined show that patterns of erosion and soil change often associated with intensification of agricultural land use and settlement during the middle-later Bronze Age, appear to be seen at earlier dates (pre-barrow construction, *i.e.* during the Neolithic-earlier Bronze Age or earlier).

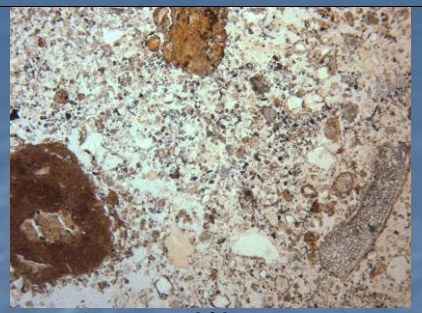


Tabon Cave, earliest human remains in the Philippines



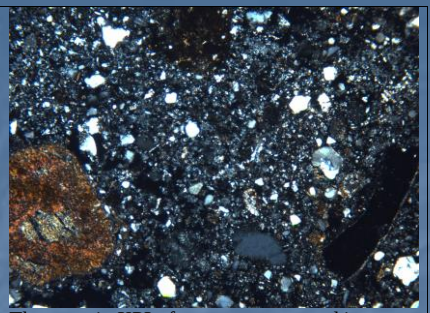


Mid Holocene beaches?

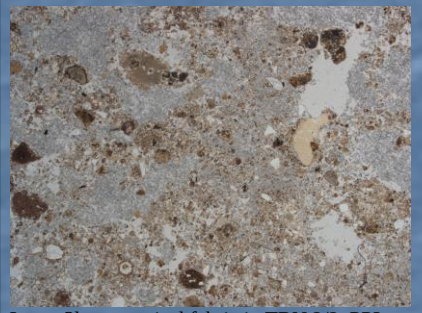


Layer 2-3upper typical fabric in TBN 2/1, PPL, with clay-rich pedofeatures & plant remains

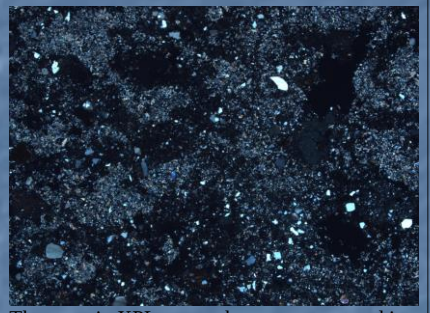
1000μm



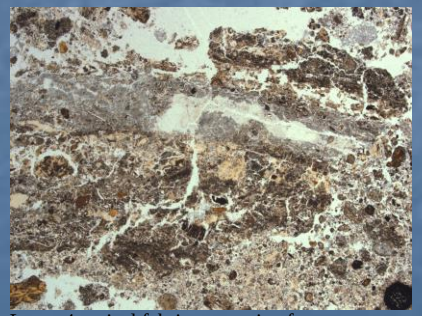
The same in XPL; frequent quartz sand is visible, along with occasional cave minerals



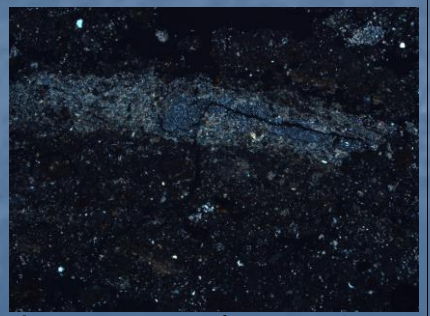
Layer 3lower typical fabric in TBN 2/2, PPL, showing frequent infills of cave minerals (grey)



The same in XPL; quartz becomes rarer, and is often found in patches; magnification is x 5.8

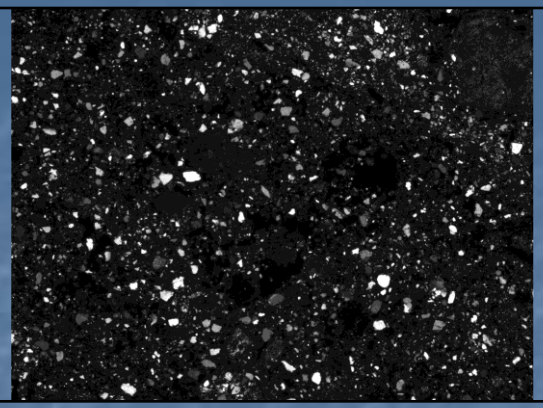
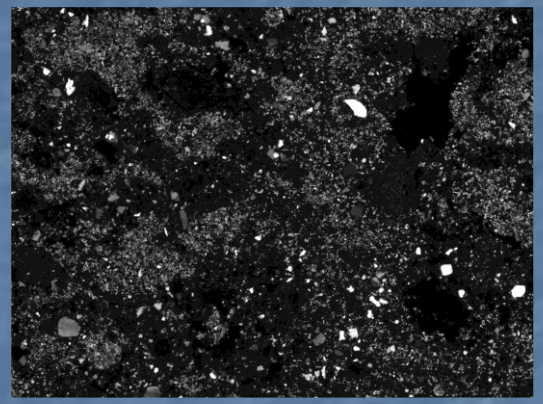
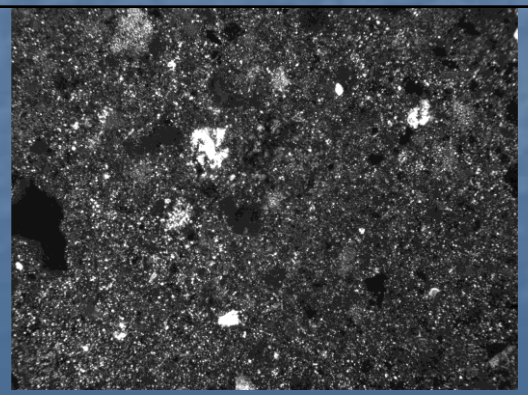


Layer 4 typical fabric, travertine fragment



The same in XPL, magnification is x 5.8

Plate 2 Layers 2-4 typical fabrics and features

	Micrograph of lower Layer 2 typical fabric in XPL, showing frequent quartz sand (white and grey grains) in a black (non-birefringent) guano-rich matrix
	Micrograph of Layer 3 typical fabric, showing a similar dark fine matrix, but frequent void infillings of precipitated fine sand and silt sized cave minerals. Occasional quartz shows up as angular to subangular white grains, often in patches.
	In Layer 6, almost every visible grain and mineralised zone is made of precipitated cave minerals, with only rare individual quartz grains.