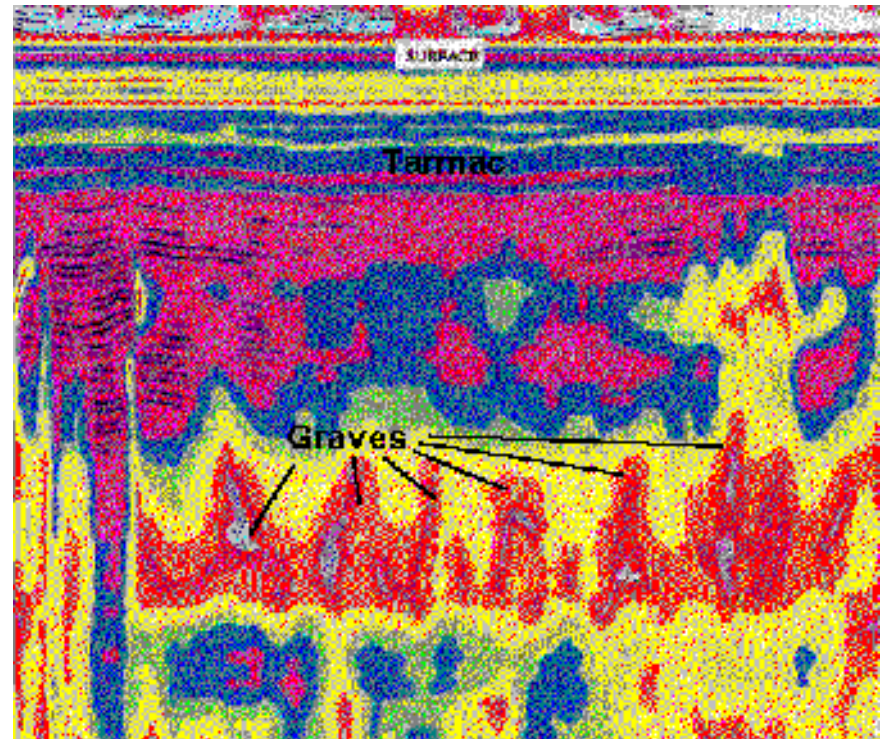




What is archaeology?

2: investigative techniques



Initial data gathering

Existing archaeological data

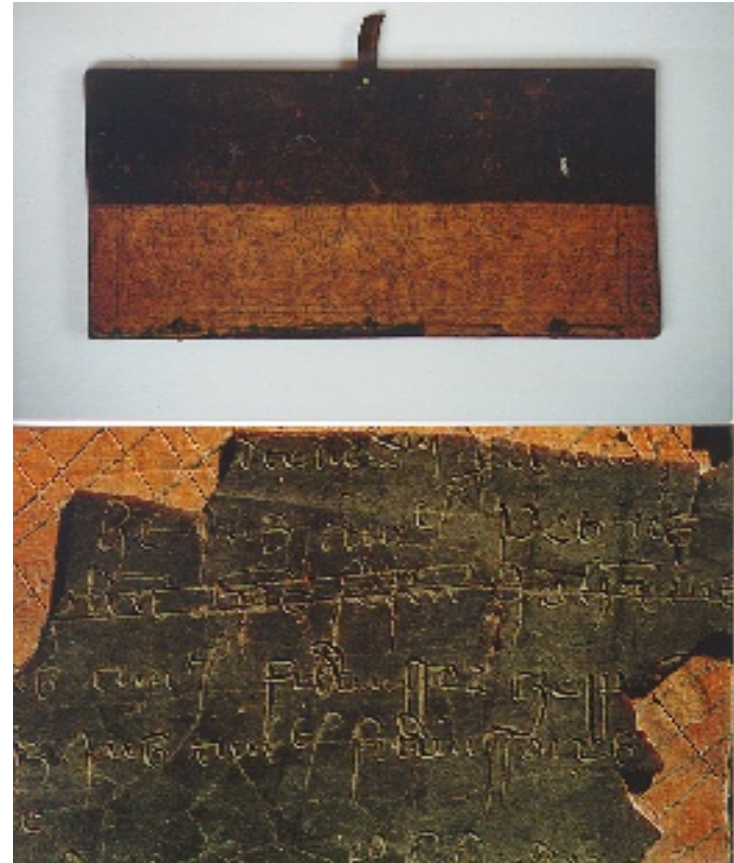
- Historic Environment Records
- Publications
- Local knowledge

Documents

- Land charters
- Old maps
- Manorial records
- Road books

Geographical Information Systems

- Predictive modelling



Aerial reconnaissance

Origins

- Franco-Prussian War
 - Balloons to spy on trenches
- Lindbergh
 - Noticed historical sites
- O G S Crawford
 - Pioneered systematic survey

Types of photography

- Oblique
 - Best for archaeology
 - Difficult to plot results
- Vertical
 - Generally taken for non archaeological purposes



Earthwork sites

Shadow sites

- Best viewed in winter
 - Vegetation has died back
 - Light dusting of snow enhances contrasts

Can reveal relationship of site to topography and other features

Drawbacks

- Only visible where there has been little ploughing



Buried sites

Crop marks

- Depends on vegetation type and soil conditions
 - Luxuriant growth and late ripening over wet soil
 - Stunted growth and early ripening over dry soil

Soil marks

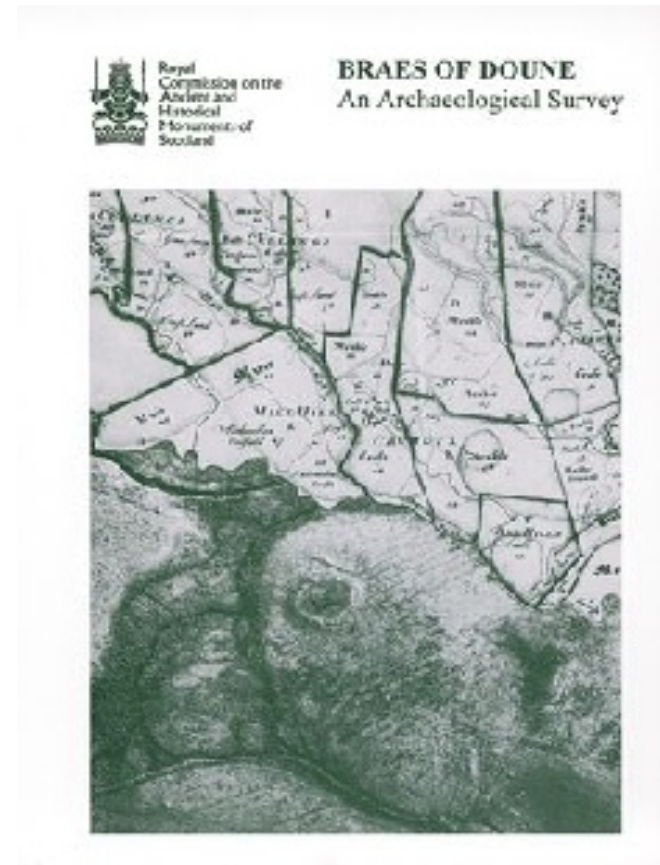
- Depends on ploughing out of different coloured materials



Archaeological survey

- ☀️ Non-destructive
 - Involves investigating the ground surface

- ☀️ Useful for characterising:
 - Form of site
 - Areas of activity
 - Date of site
 - Relationship of site to surroundings



Fieldwalking

Literally what it says

- Walking across the ground to pick up objects
- Must be done on ploughed land
 - Best after frost
 - A mainly winter activity!

Systematic or unsystematic

- Recording finds
 - By transect
 - By grid
- Patterning



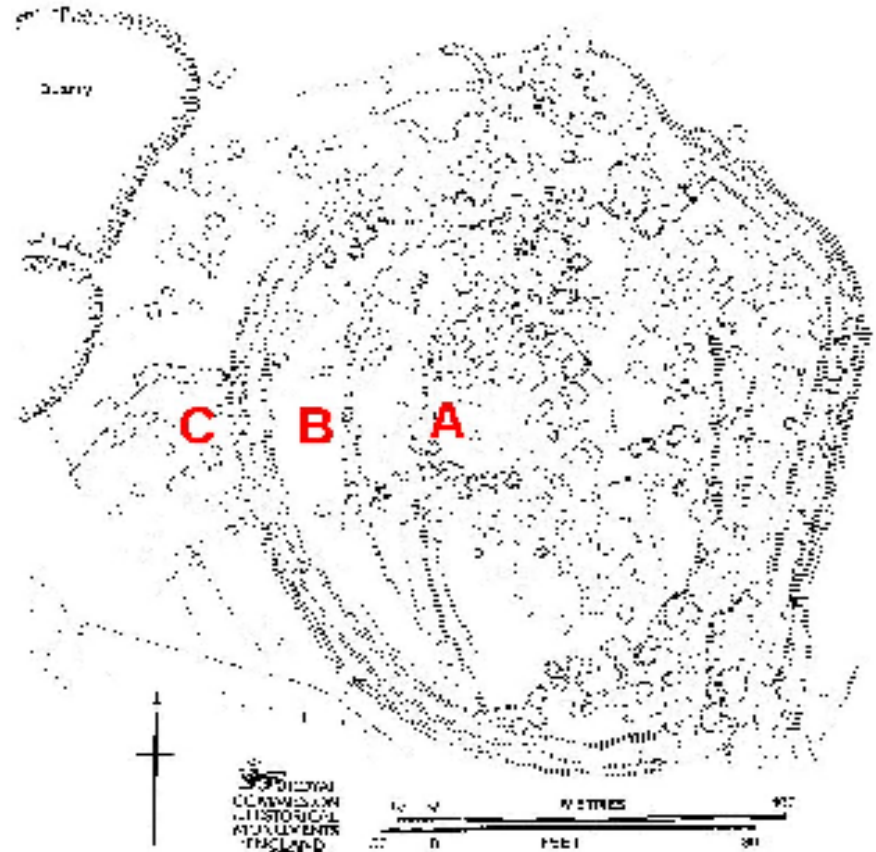
Surface survey

 Recording
upstanding remains

- Earthworks
- Buildings

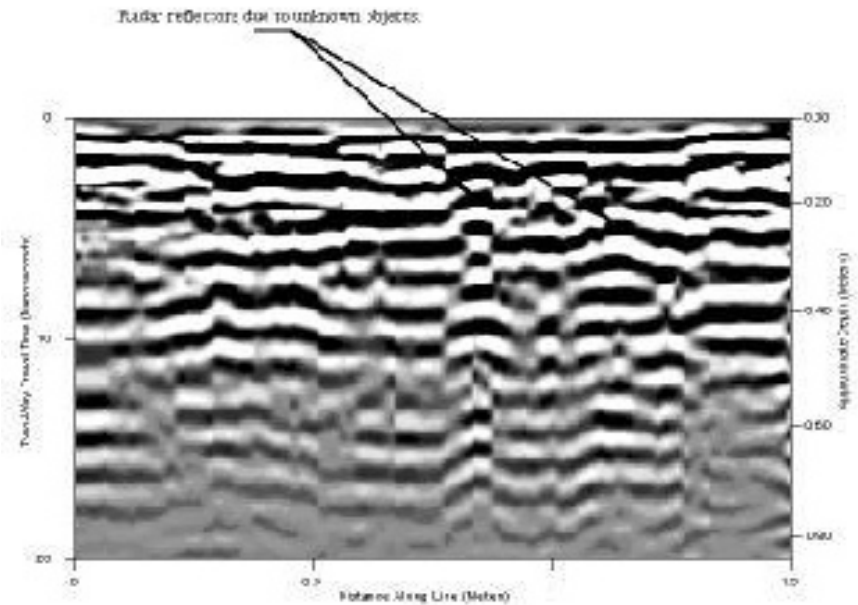
 Techniques

- Triangulation
 - Measuring using
tapes, plane table,
theodolite, crosshead
- Electronic
 - EDM or GPS



Geophysical survey

- Used where existence of site is known
 - Distinguishes anomalies of human origin under topsoil
 - Non-destructive
- A variety of techniques in use
 - Area of active research
 - Refinements and new techniques constantly added



GPR transect collected along the floor of Building 3.

1000 MHz Antenna

Magnetometry

- ☀ Thermoremanent magnetism
 - Fired clay
 - Hearths, kilns and furnaces
 - Pits and ditches
- ☀ Equipment
 - Proton magnetometer
 - Proton gradiometer
 - Fluxgate gradiometer
- ☀ Detects small deviations in background magnetism
- ☀ Systematic survey



Soil resistivity

Soils conduct electricity

- Passing a current shows resistance
 - Resistance varies according to moisture content
- Can depend on buried features
 - Walls have less moisture than soil
 - Pits and ditches have more



GPR

- ☀️ Invented in 1970s
 - Archaeological applications since late 1980s
- ☀️ Low frequency pulses
 - Poor resolution
 - Detects interfaces
 - Relatively new technology
 - But constantly improving
- ☀️ Shows depth of features
 - Allows an assessment of layering and therefore of date



Other techniques

- ☀ Soil conductivity
 - Related to resistivity
- ☀ Metal detectors
 - Useful on topsoil and spoil heaps
- ☀ High frequency seismic sounding
- ☀ Microgravity
- ☀ Bosing and dowsing
 - Controversial
 - Former depends on skill
 - Latter may be charlatanism!



Subsurface probes

Probing

- Thin metal rods
 - Blocked by walls

Augering or coring

- Removes samples of soil
 - Hindered by walls, large stones etc.

Shovel testing

- Potentially destructive

Lerici periscope



Chance discovery

🔦 Lascaux

- Dog fell into hole
- Schoolboys followed

🔦 Kaminaljuyu

- Football club extended pitch
- Discovered Maya pyramids

🔦 Rescue archaeology

- “Watching briefs” on sites of suspected but unknown importance



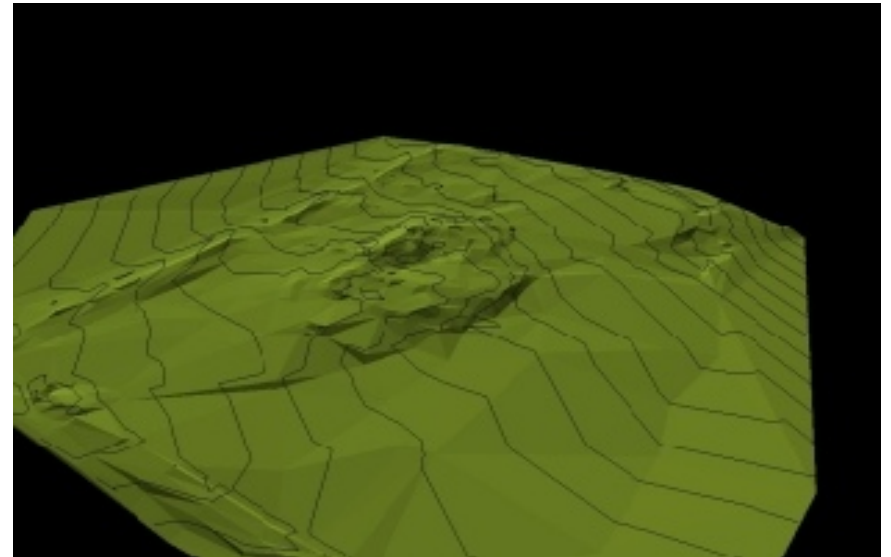
Field survey projects

- ☀️ Rarely directed at individual sites
 - The landscape is the usual target
 - Deals with large area
- ☀️ Analysis of long term change
 - Settlement patterns
 - Environmental factors



Landscapes and GIS

- ☀ Places humans into broad environmental context
 - Integrated approach
- ☀ Computing
 - Surface modelling
 - Shadow casting
 - Site catchment
- ☀ Understanding the long term
 - Continuity and change
 - The place of the past in the present
 - There is rarely a 'clean slate'



Excavation is destruction

- ✦ Hard for the public to grasp
 - “A totally excavated site is a totally destroyed site”
- ✦ The importance of the site lies in its totality
 - The relationships between deposits, finds and structures
- ✦ Structures are perhaps the least informative discoveries
 - But they are what appeals to the general public



The goals of excavation

- ✂ To reveal 4-dimensional relationships between:
 - Features
 - Artefacts
 - Ecofacts
- ✂ Highest profile activity of archaeologists
 - Wrong to assume that it's our primary activity



Types of excavation

Research

- Excavation of sites not threatened by destruction

Rescue

- Excavation of sites threatened by destruction

Salvage

- Excavation of sites undergoing destruction



The effects of excavation

- ✚ Excavating removes all traces from the ground
 - A completely excavated site is a completely destroyed site
 - Re-excavation impossible
 - Like an historian burning a unique manuscript
- ✚ So good recording is vital



So why excavate?

- 🔦 Hypothesis testing
 - Answering research questions
- 🔦 Enhancing public understanding
 - Displaying monuments
- 🔦 To record
 - In advance of destruction



The nature of archaeological remains: contexts

Contexts

- Deposits
 - Layers of soil
 - Floors
- Features
 - Walls
 - Pits
 - Ditches



The Law of Association

- 🔍 Objects found together have the same date
 - Primary context
 - Secondary context
- 🔍 Site assemblages
 - Phased groups
 - Individual feature groups
 - Pit groups
- 🔍 Establishing sequence of artefacts
 - Relative dating



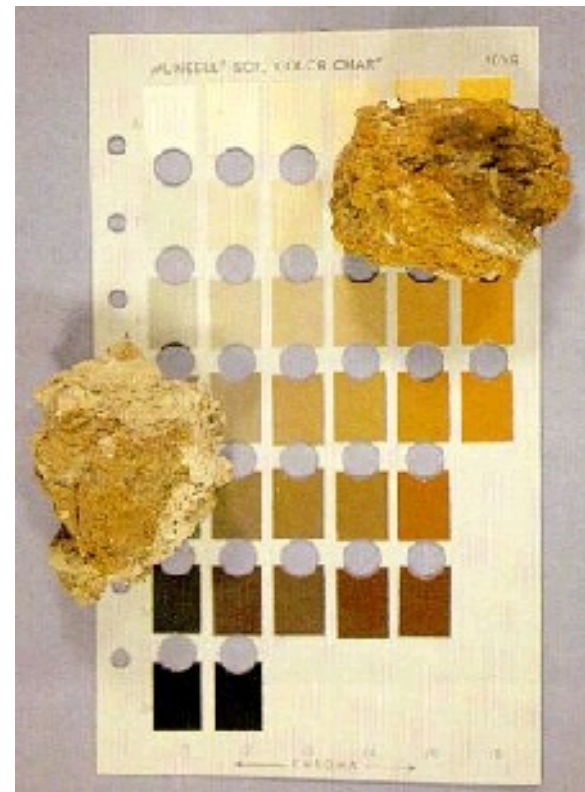
Deposits

How to distinguish them?

- Colour
- Texture
 - Particle size
- Consistence
 - Degree of compaction
- Coarse components
 - Stones etc.

Spoil

- Soil removed from an excavation
 - NOT treasure!



Natural

☀️ But surely, all soil is natural?

- To an archaeologist, 'natural' means untouched by human hand
 - Subsoil...
 - Bedrock...
 - Drift deposits...

☀️ Interesting deposits form under human influence

- Directly
 - Dumps of soil
- Indirectly
 - Hillwash



Features

Traces of human activity

- Positive features
 - Things with a physical presence
- Negative features
 - Things that exist as 'holes' in the underlying deposits

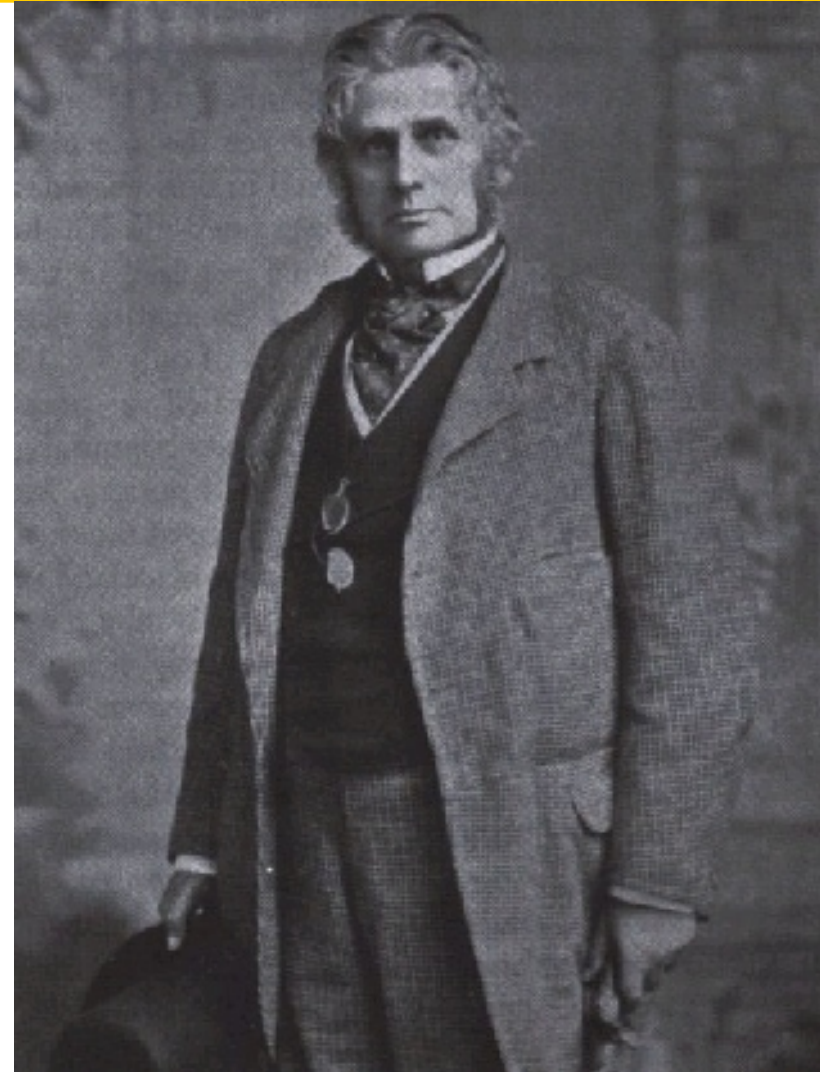
The direct result of human behaviour

- Intentionality
- Some exceptions
 - Hen hollows
 - Tree boles



Stratification

- 🔦 Geological principle
 - Based on observations of rock formation
 - Oldest sediments at the bottom of the sequence, youngest at the top
- 🔦 Examining the layers of a site
 - Excavate to remove deposits in reverse order
 - Going backwards through time
 - Artefacts become supplementary data
 - Help to date each deposit
 - The sequence gives the story of the site through time
- 🔦 General Pitt Rivers (1827-1900)
 - First to attach importance to finds and their context



Archaeological stratification

- Succession of contexts
 - Visible in sections
 - Earliest at bottom, most recent at top
 - Complicated by human activities
 - Cutting holes, dumping materials

- Systematic recording
 - Essential to understand sequence of events
 - With dated finds, allows chronology to be established



Archaeological stratigraphy



Ed Harris

- Winchester in 1960s
 - And commonplace by the early 1980s



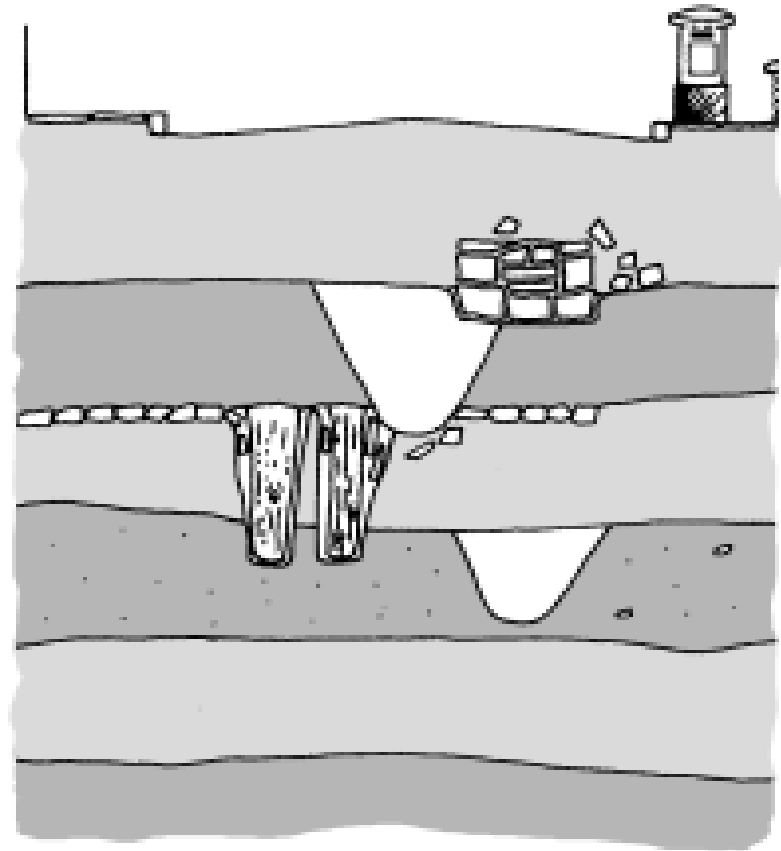
Theoretical basis

- The 'context' defined as the smallest unit of stratification
- Four dimensional entity
 - Length
 - Width
 - Depth
 - Time to form



Dominant in British archaeology

- Uncommon in Europe or the USA



The relationships



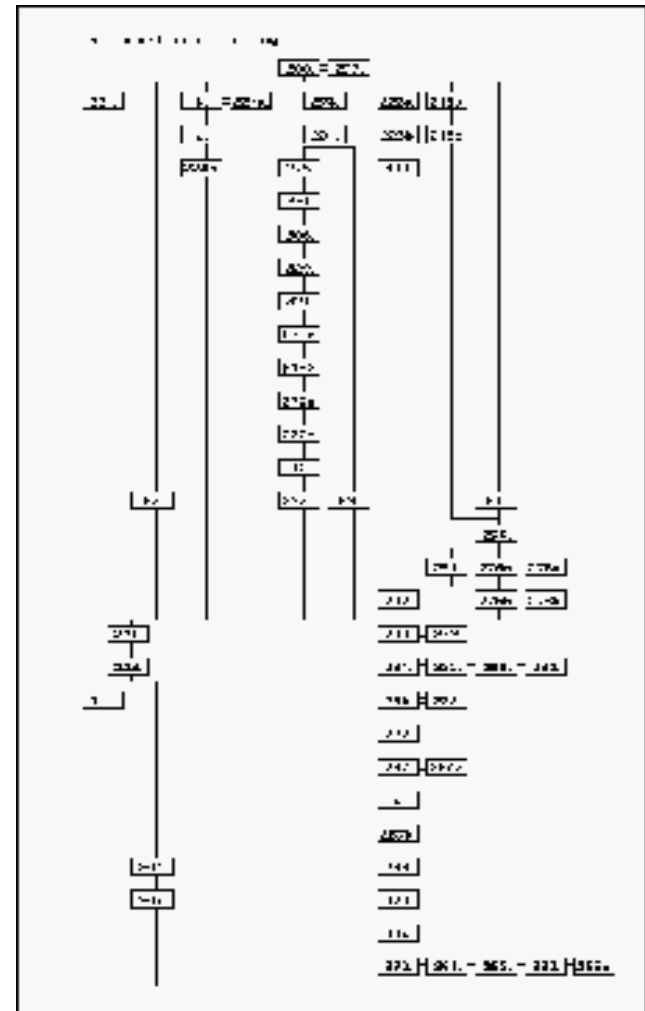
Only four possible relationships:

- A is above (later than) B
 - Deposit A seals context B or cut A is dug through B
- A is below (earlier than) B
 - A is sealed by deposit B or B fills cut A
- A is contemporary with B
- A and B have no relationship



Sequence worked out from relationships

- This gives the sequence of deposition on the site
 - Which gives us an historical sequence



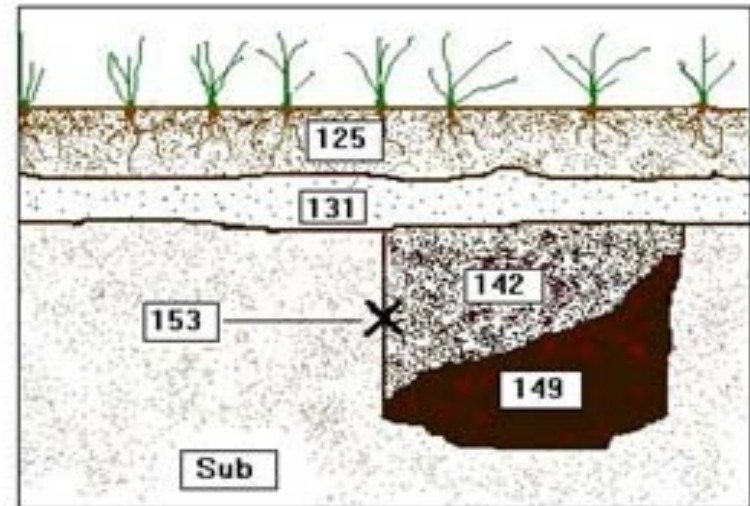
Recording stratigraphy

The 'single context system'

- A single numeric sequence is used for all contexts
 - Deposits
 - Interfaces
 - Cuts, surfaces etc.

The Harris Matrix

- Records sequence visually
 - The earliest contexts are placed at the bottom, the latest at the top
- Summarises history of site



How do we recover the data?

Heavy digging equipment

- JCBs
 - Mechanical removal of 'overburden'
- Shovels
 - Removing large amounts of loose soil
- Mattocks/pickaxes
 - Breaking up deposits quickly and in bulk
- Hoes
 - To level off exposed deposits



Light digging equipment

Trowels

- The basic tool
- All-purpose

Plasterers' leaves

- Good for fine work

Dental picks

- For very fine work
 - Excavation of foetuses etc.

Brushes should not be used

- Despite what you see on television!



Excavation technique 1

- ✂ Scraping, not digging
 - Following profile of context
 - Scrupulously clean
- ✂ Alert to soil changes
 - Colour, texture, consistency, sound, even smell
- ✂ Not necessarily slow
 - Some deposits can be removed quickly, while others need more care
- ✂ One context at a time
- ✂ Collect finds as they fall out
 - Don't lever out large finds or stones...
 - Put finds directly into labelled tray or bag



Excavation technique 2

Keep the working area clean

- Do not walk on cleaned areas
 - Do not walk in front of other people

Dispose of spoil immediately

- Keep putting it into a bucket or barrow
 - Don't create a pile between you and where you are working
- And don't leave it near the trench
 - 1 m³ of soil weighs a tonne



Summary

- 🔦 Numerous techniques are available
 - Excavation is not the be-all and end-all of archaeology
 - And it is destructive
 - Need to strike a balance between discovery and preservation
- 🔦 There are many different scales of research
 - Large landscape studies
 - Involving numerous specialised techniques
 - Development-led 'rescue' excavation
 - Individual test pits
- 🔦 The aim is always to increase our knowledge of the past
 - Our understanding of human behaviour





What is archaeology?

2: investigative techniques

