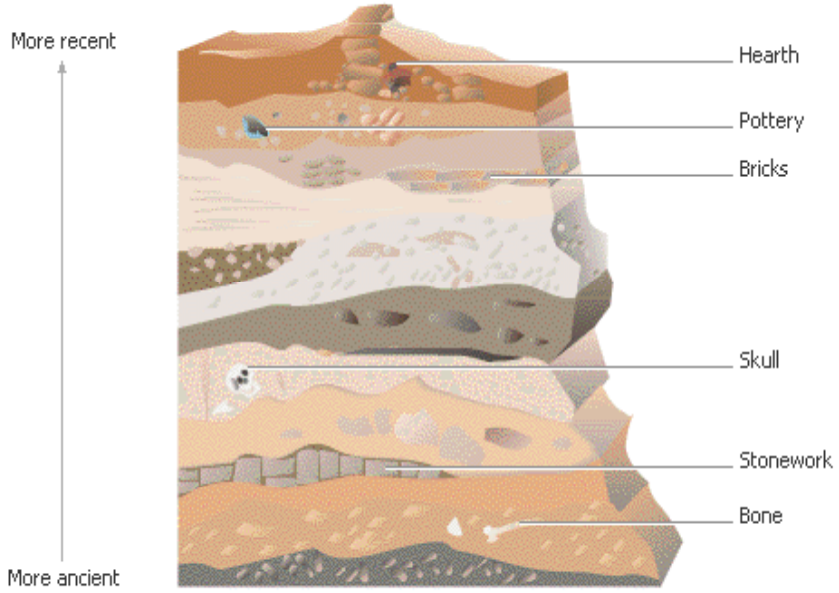
Dating in archaeology: Relative Chronology

Methods of establishing relative dates in archaeology

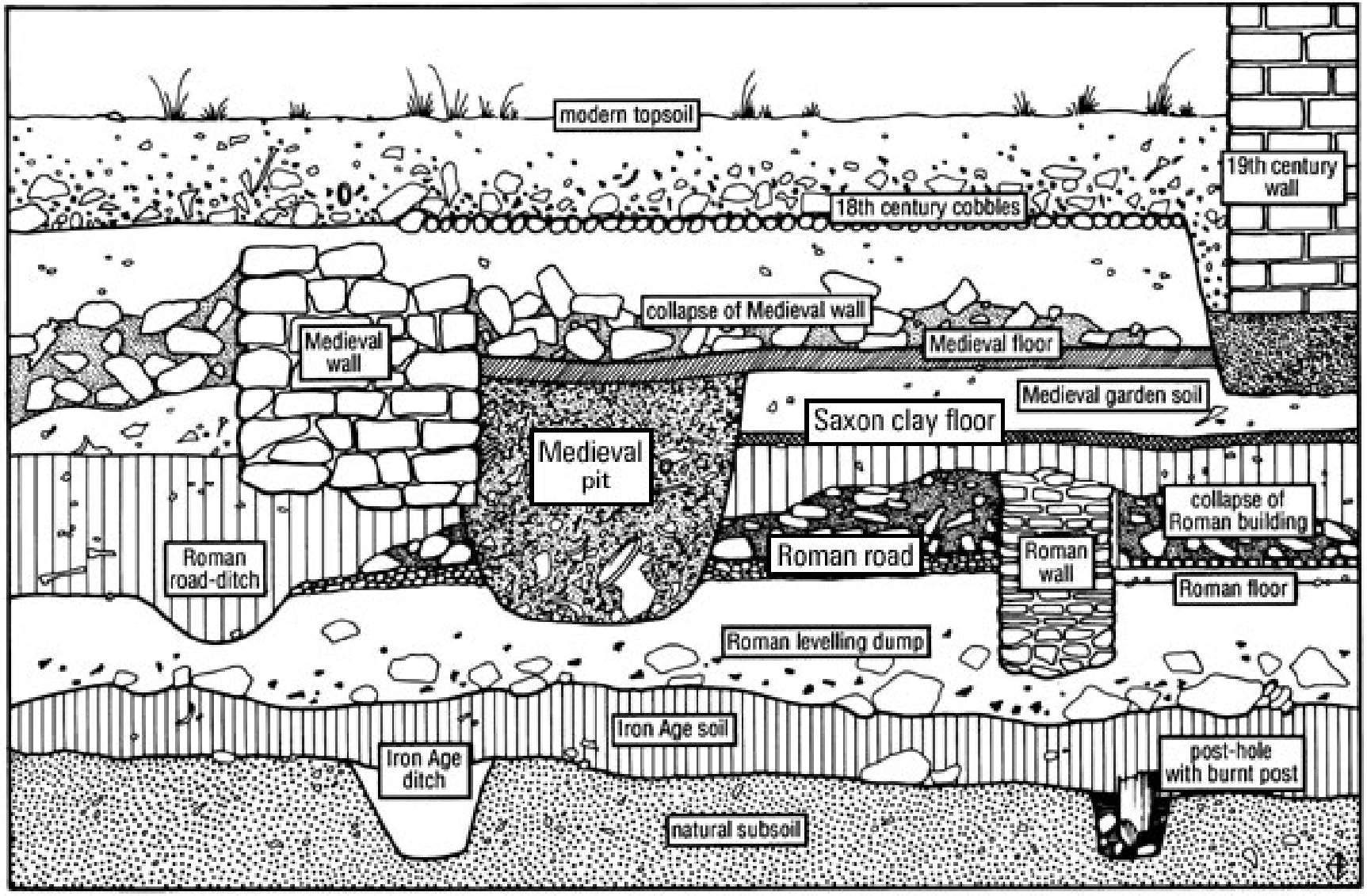
➢ Stratigraphy

Law of Superposition: Sequences of layers,
bottom to top = earlier to later

Refers only to stratigraphy, <u>not</u> the materials in the strata



Stratigraphic relationships provide clues to temporal sequences

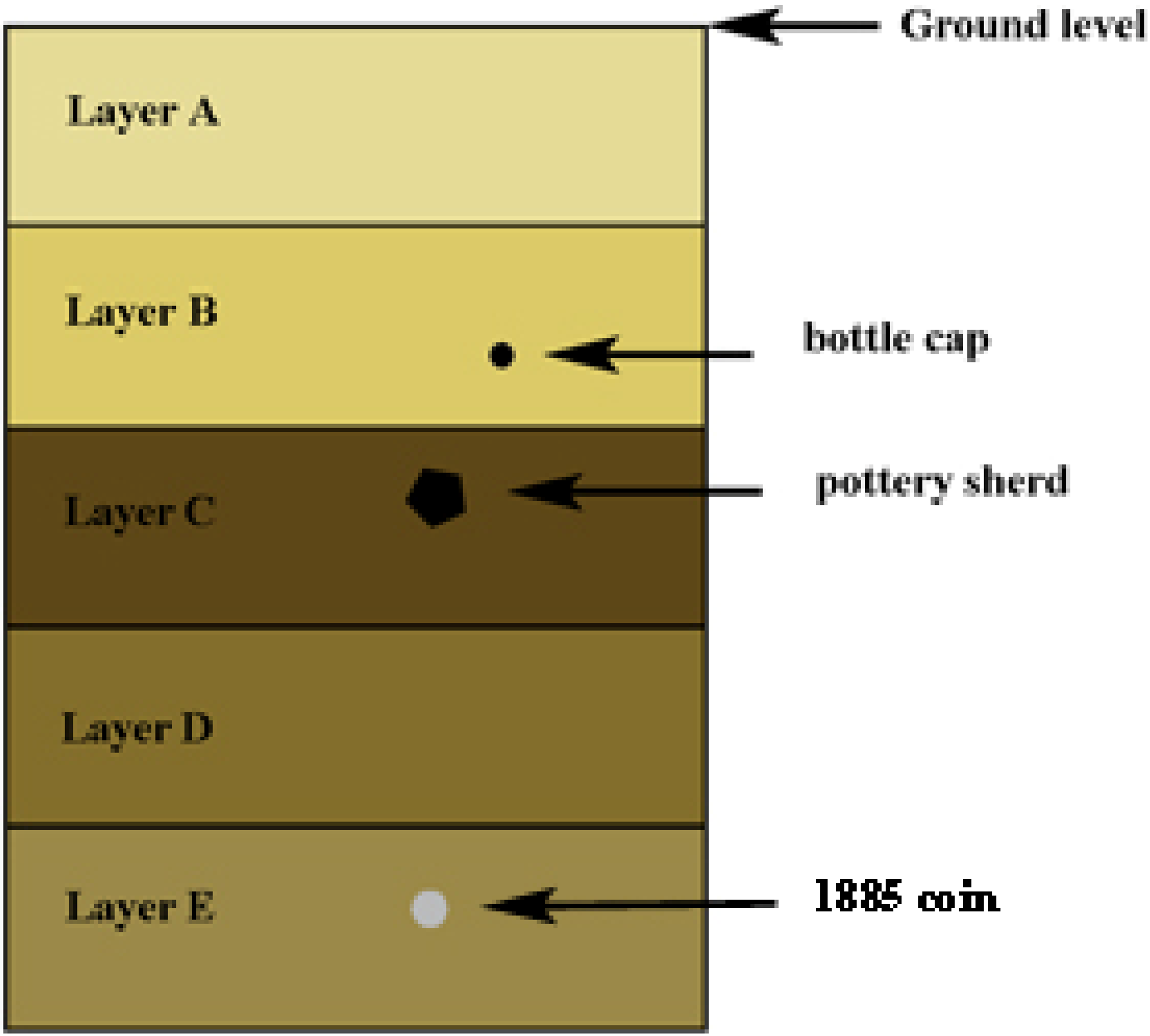


Methods of establishing relative dates in archaeology

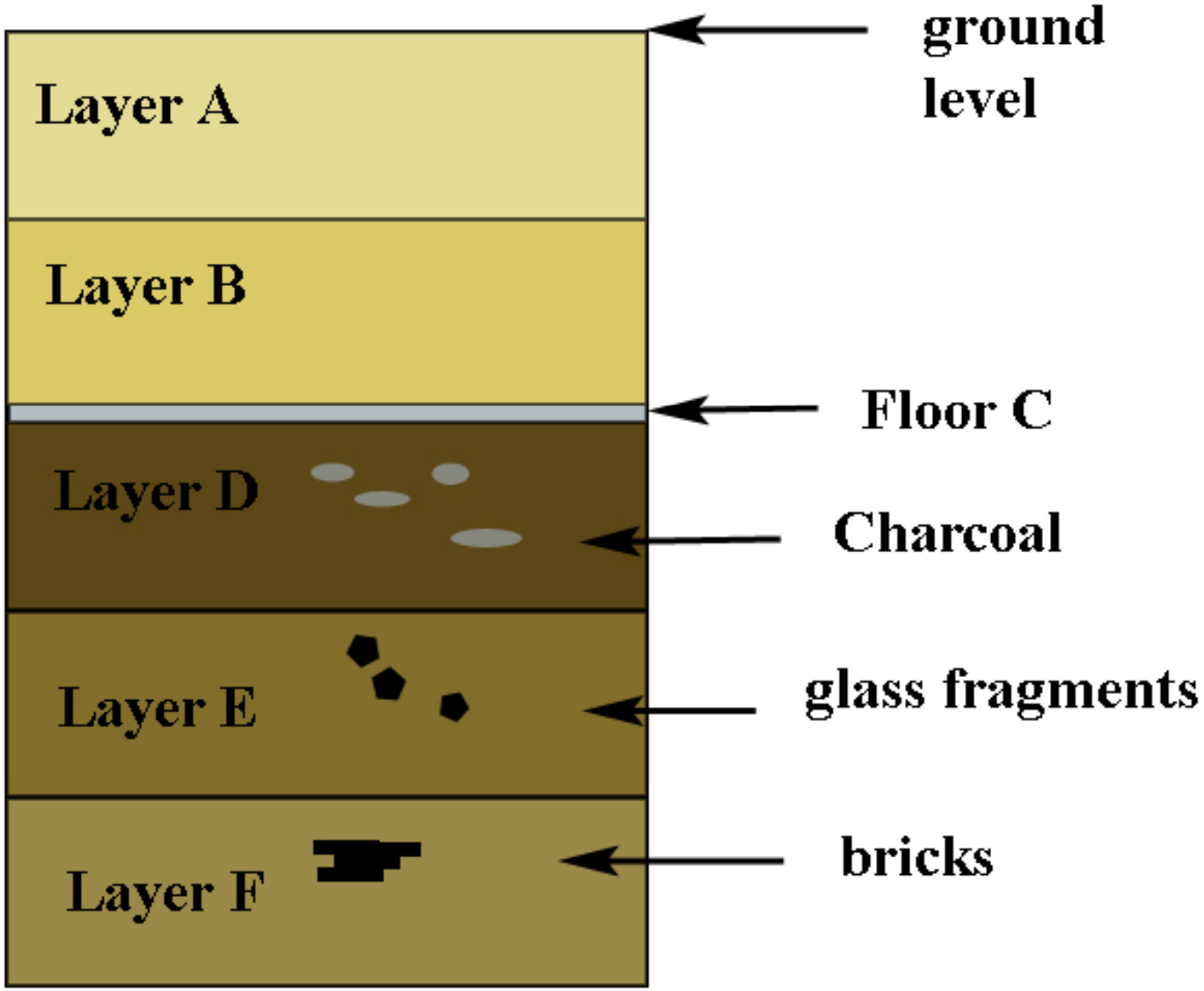
- **The relationship of strata provides evidence to establish a relative sequence of the artifacts and features in the strata**
- **Artifacts and features in each strata are dated by *association* with the layer in which they are found, but only if it is a 'sealed' layer without evidence of intrusions**
- **The strata can be linked in a temporal sequence (Harris Matrix)**
- **If objects in each layer can provide evidence of an absolute date (such as a coin or inscription), it is possible to build a firm chronology for the strata, but you need to always take into consideration site formation processes**

Methods of establishing relative dates in archaeology

- **In general terms each strata is dated by the latest object found in it**
- **Earliest possible date is referred to as the *terminus ante quem***
- **Latest possible date is referred to as the *terminus post quem***
- **These terms are generally used in relation to 'sealed' deposits, with no disturbances or intrusions**


Ground level
Layer A
Layer B
bottle cap
Layer C
pottery sherd
Layer D
Layer E
1885 coin

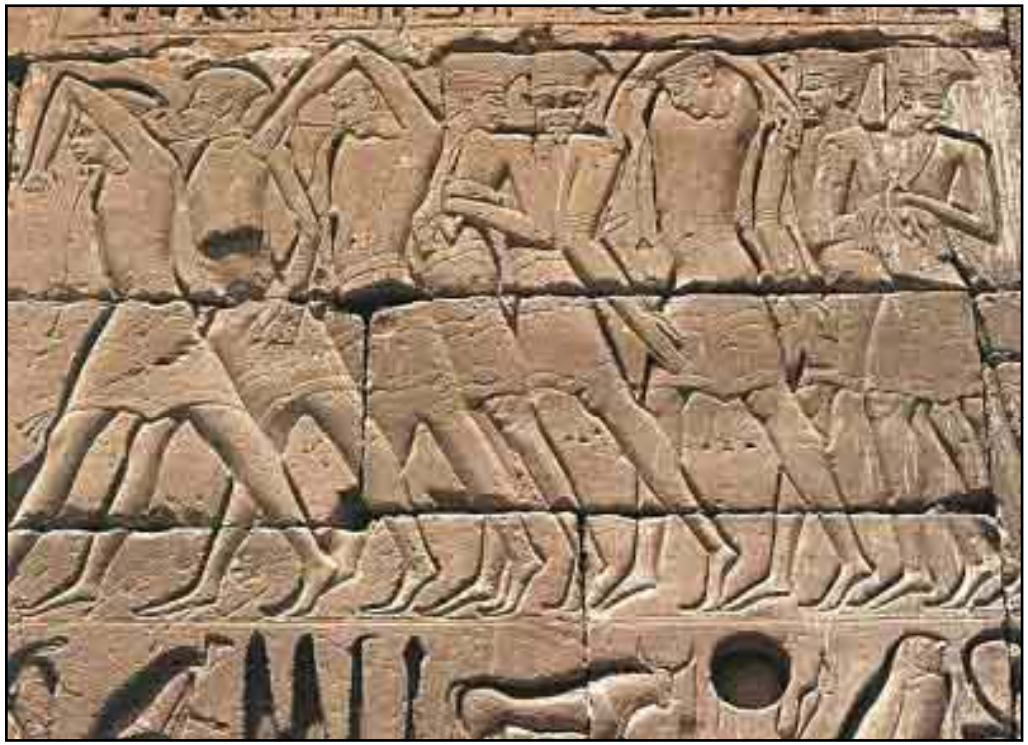
- *Terminus post quem* refers to the idea that a datable object provides only the date *on or after* which the layer of soil that contains it was deposited
- The 1885 coin in Layer E establishes that Layer E dates from or after 1885.
- It follows that the pottery sherd in Layer C and the bottle cap in Layer B likely date from or after 1885


Layer A
Layer B
Layer D
Layer E
Layer F
ground level
Floor C
Charcoal
glass fragments
bricks

- *Terminus ante quem* refers to the idea that all the soil below a solid, undisturbed layer dates before that layer

- Layer C is an undisrupted tile floor of the 1860s. It follows that Layers D, E, and F date before the 1860s

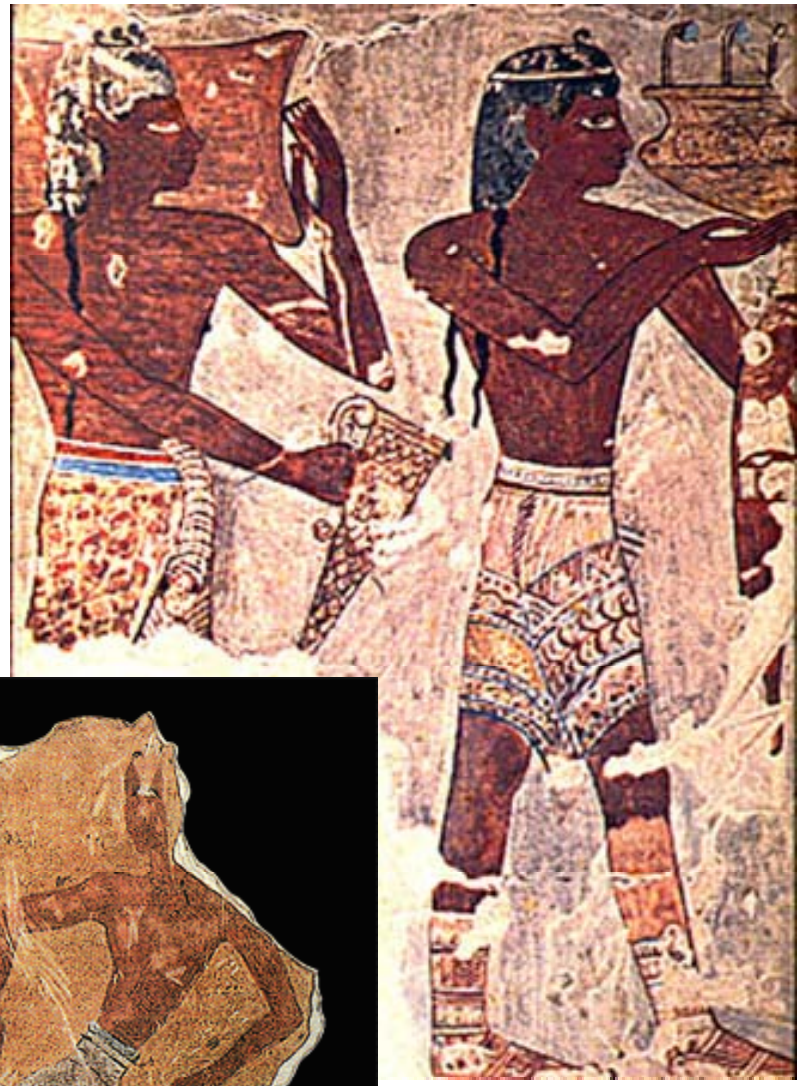
Cross-dating

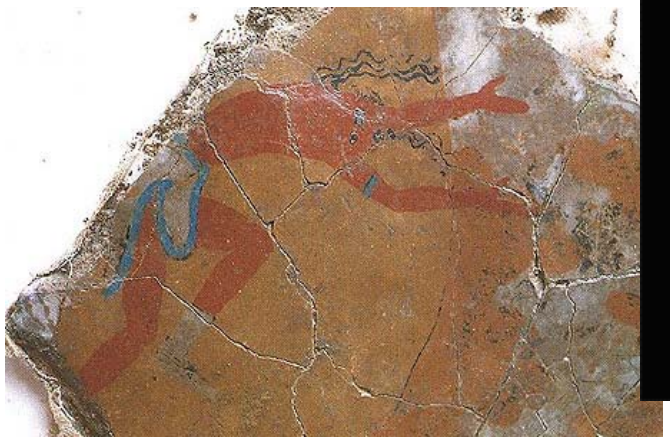


Cross-dating

- One of the traditional ways to establish chronologies in the Old World is by reference to known historical dates and artifacts
- In the Mediterranean world this usually means by reference to ancient Egyptian and Assyrian chronologies
- In Egypt we use cross references to the list of Pharaohs provided by Manetho as well as inscriptions
- In Assyria, we use the Assyrian king list
- Both have problems of accuracy, but have proven useful as ‘anchors’ for specific periods

Minoans in Egypt during the Middle Kingdom





Cross-dating

- Ulu Burun shipwreck

Methods of establishing relative dates in archaeology

Seriation

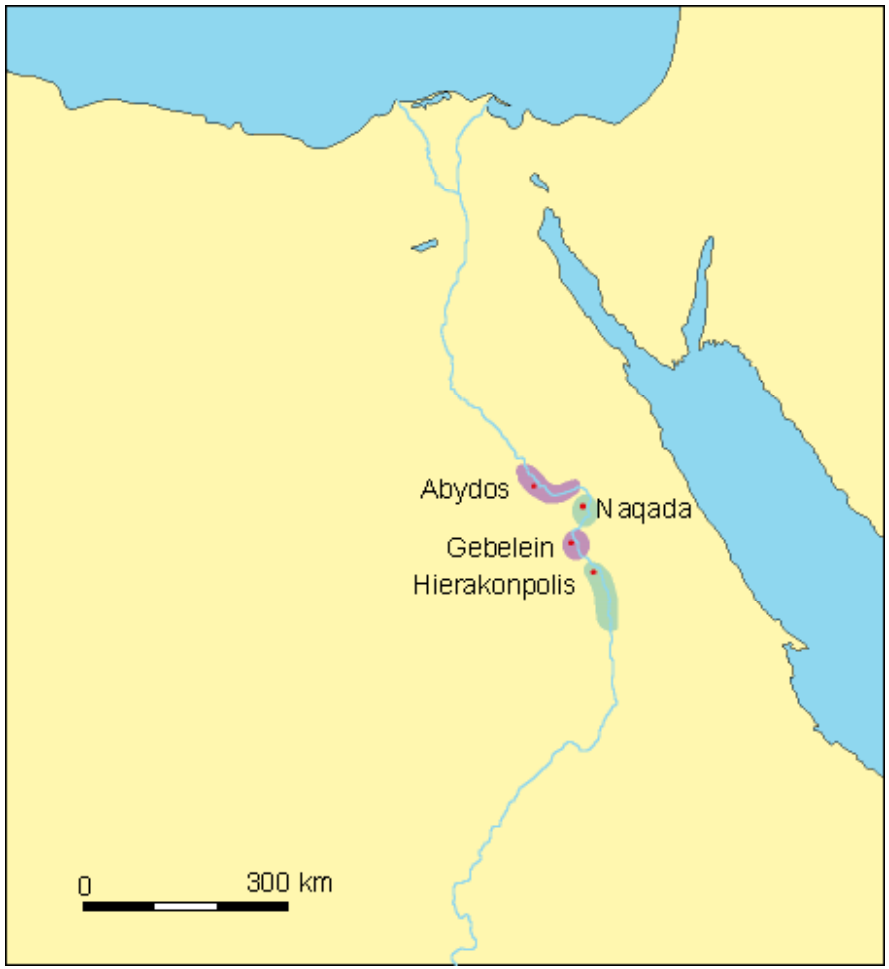
There are two types of seriation:

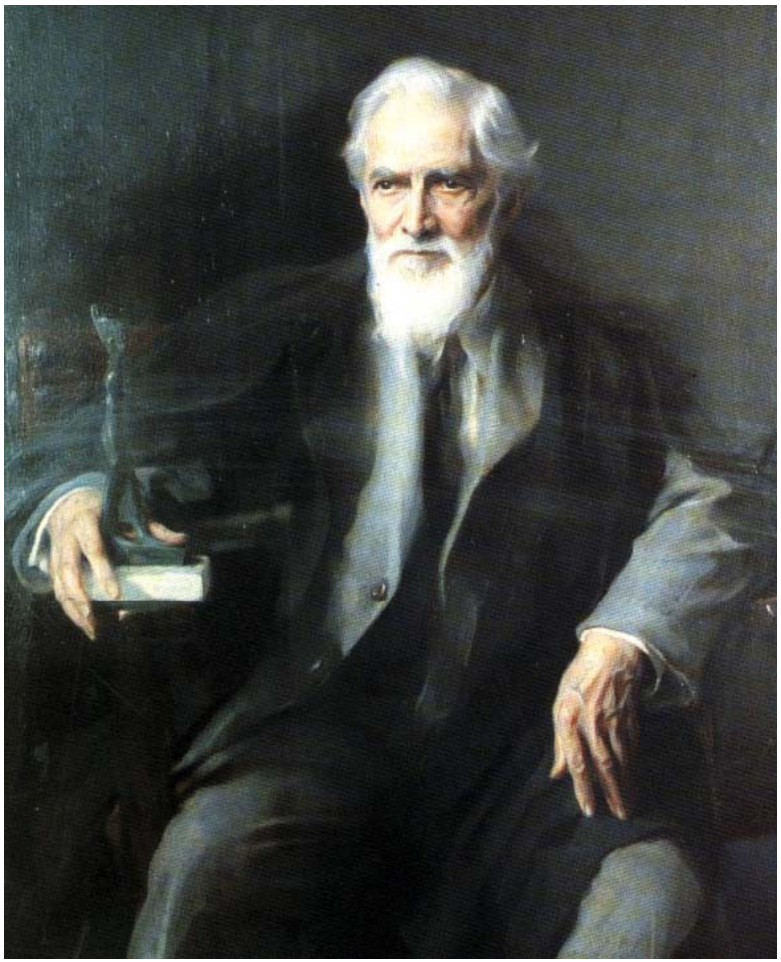
1. **Contextual seriation:** the duration of different artifact styles
2. **Frequency seriation**: measures changes in the proportional abundance or frequency of an artifact

Seriation

1. Contextual seriation: the duration of different artifact styles

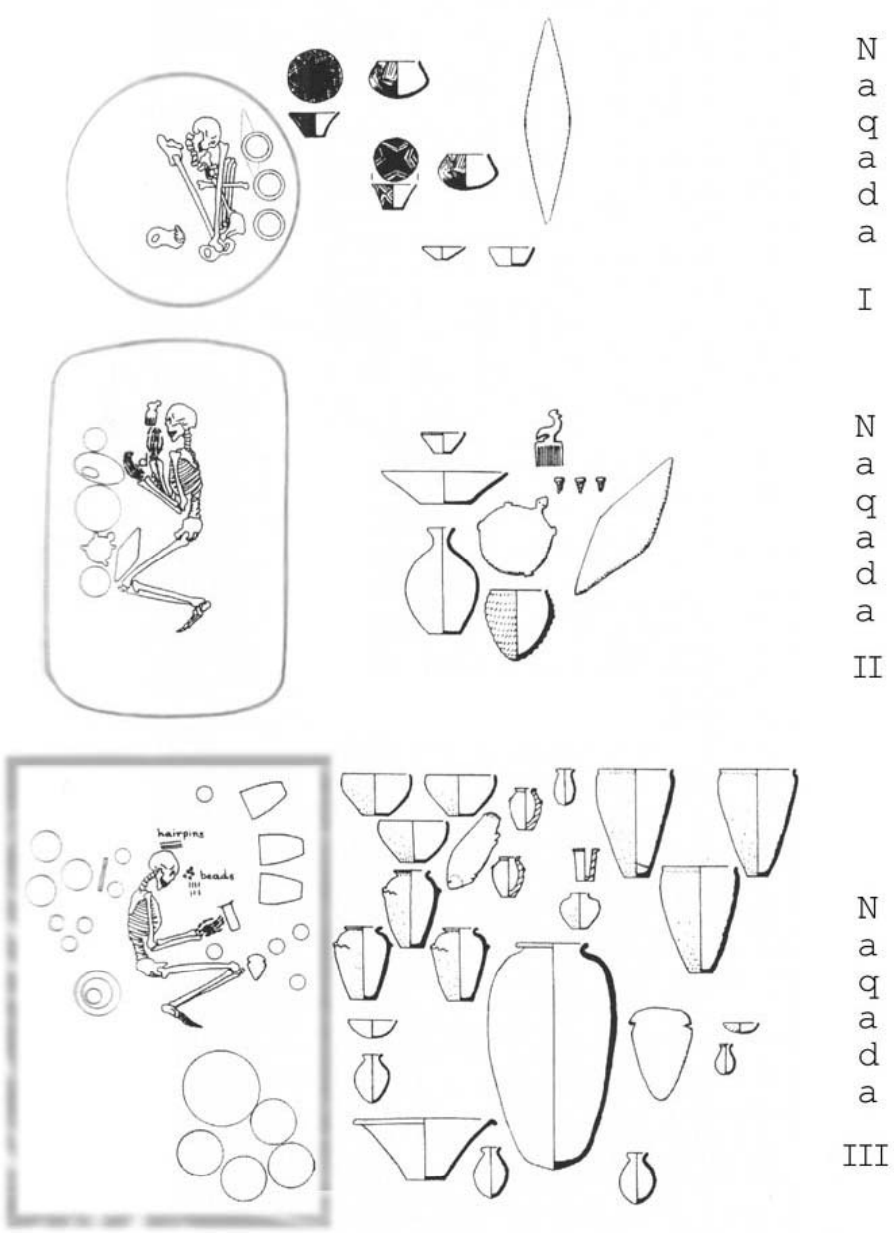
Examples include the work of Flinders Petrie at Naqada





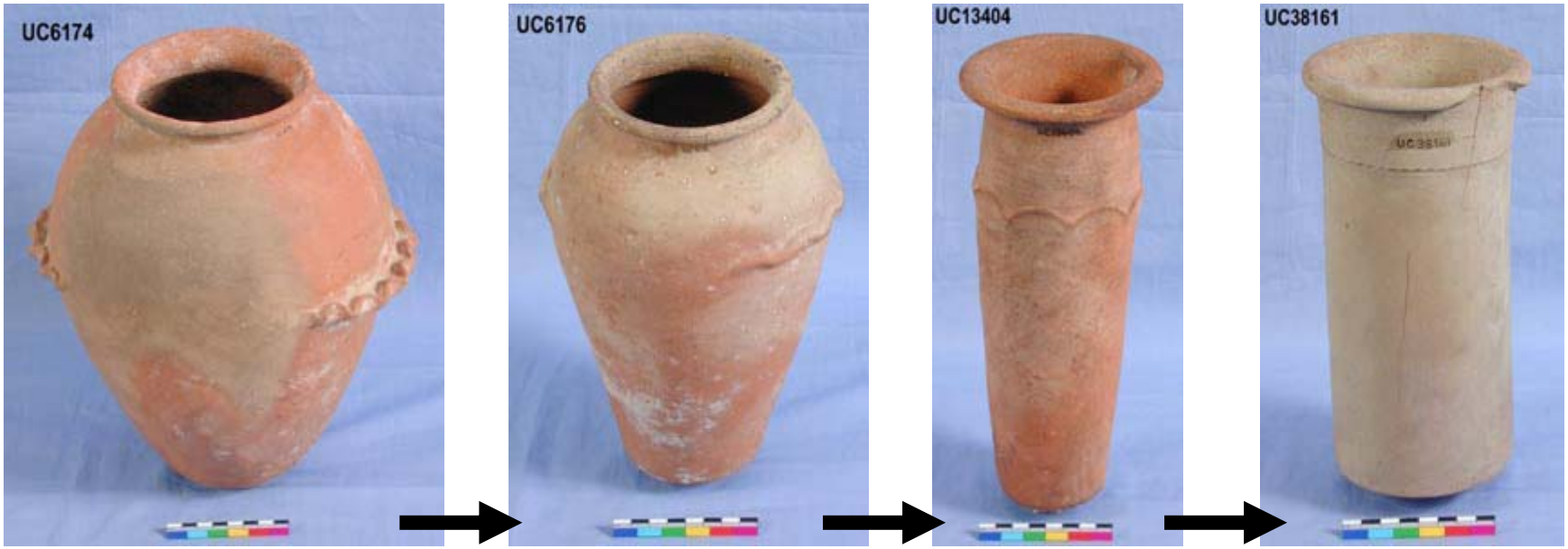
Naqada tombs

- **Date to the Predynastic period of Egypt**
- **A phase of development before the Old Kingdom**
- **Petrie excavated 900 graves at Naqada**
- **He carefully recorded the contents of each grave, paying particular attention to the pottery from each**

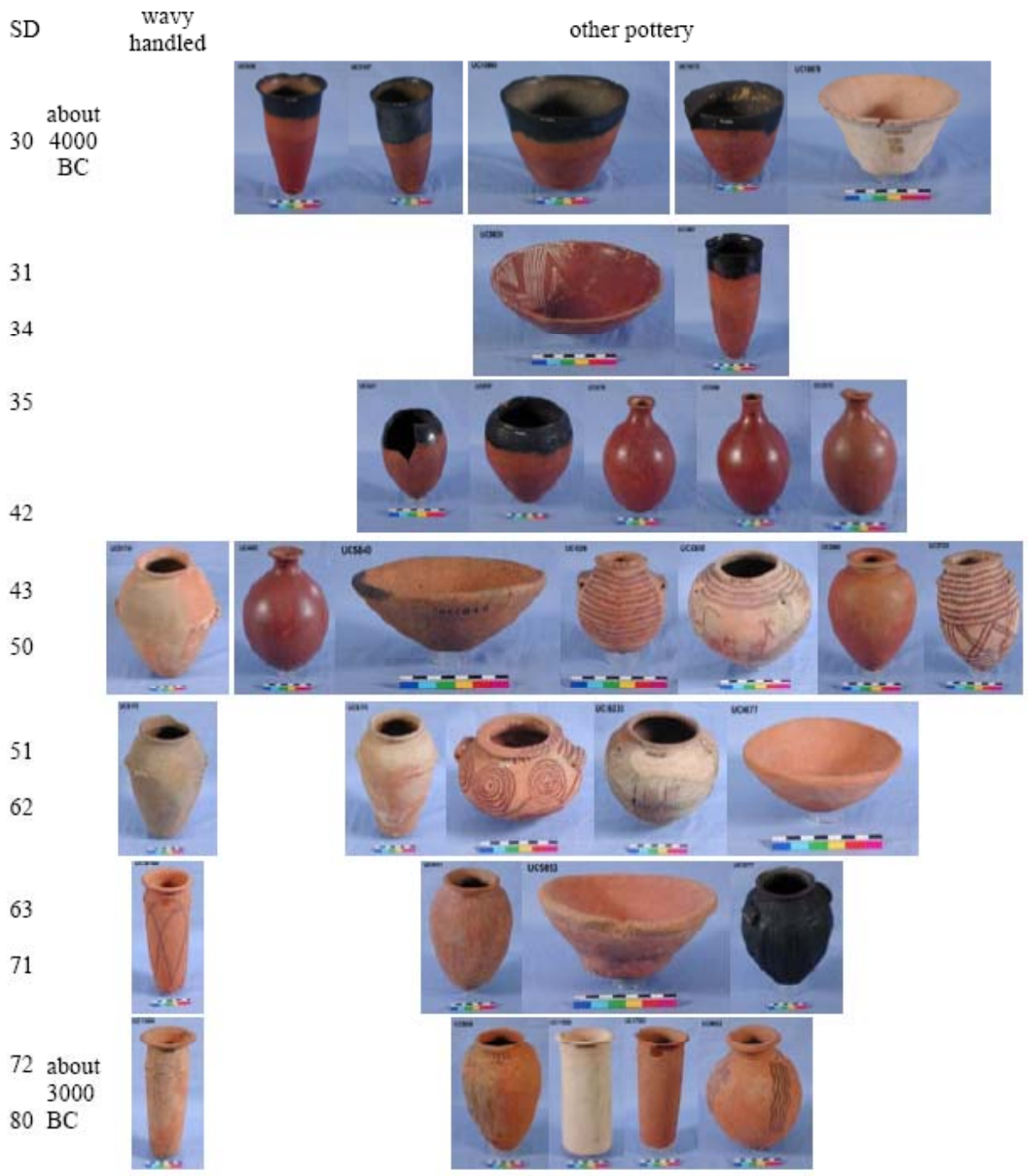


General characters of tombs and grave-goods during Naqada I-III
(after B. Adams, slightly modified by the author)

- **Petrie took the wavy-handled pottery as guide.**
- **He recognized gradual change from globular to narrow cylindrical types.**
- **The globular are the older while the cylindrical are the later types which he found in the royal tombs of the First Dynasty tombs**



- **Petrie examined which types occur regularly together with the wavy-handle pottery and which not**
- **A large part of the pottery was not found with the wavy-handled.**
- **In particular the cross-lined ware was never found with it, so it must have been the furthest removed in time from the wavy-lined**


SD
wavy handled
other pottery
about 4000 BC
30
31
34
35
42
43
50
51
62
63
71
72
about 3000 BC
80

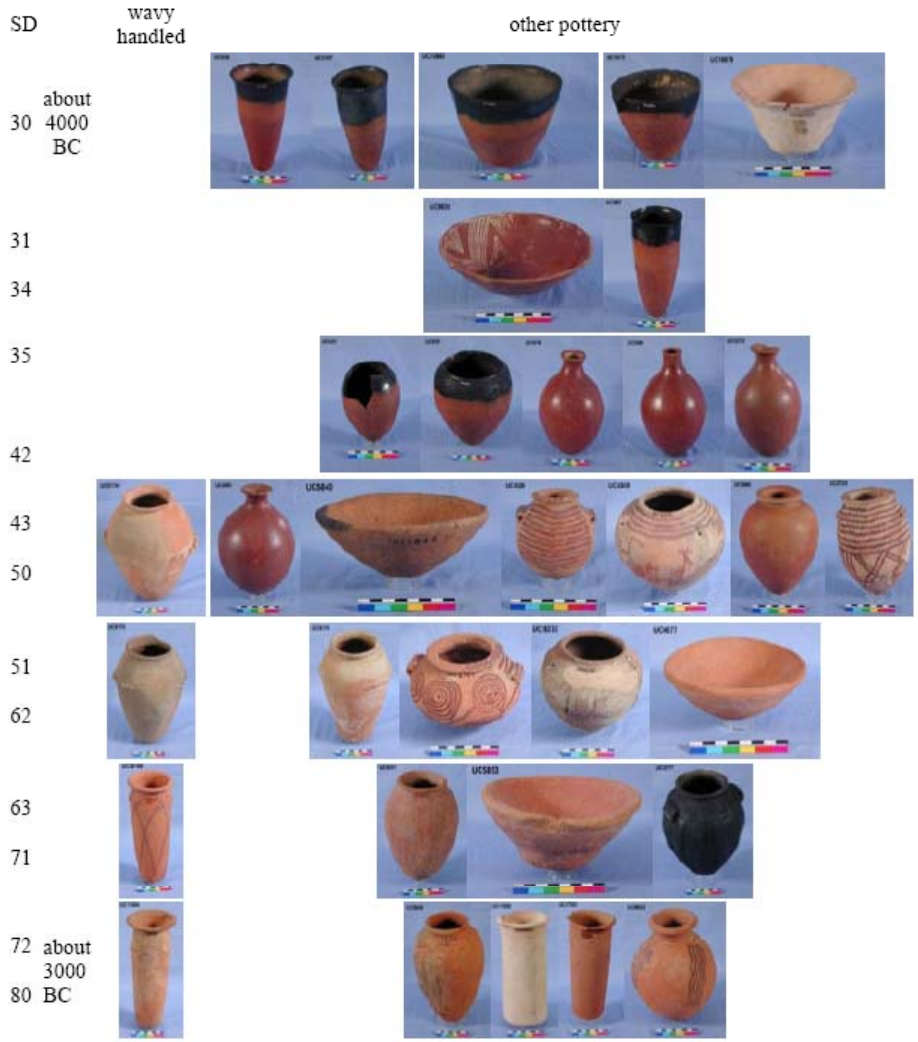
- Petrie produced for every tomb a card with the main types of finds, especially pottery, recorded from that tomb

- These cards were hand-sorted until all 900 tombs were then placed in their most probable order and then divided in 51 equal sections

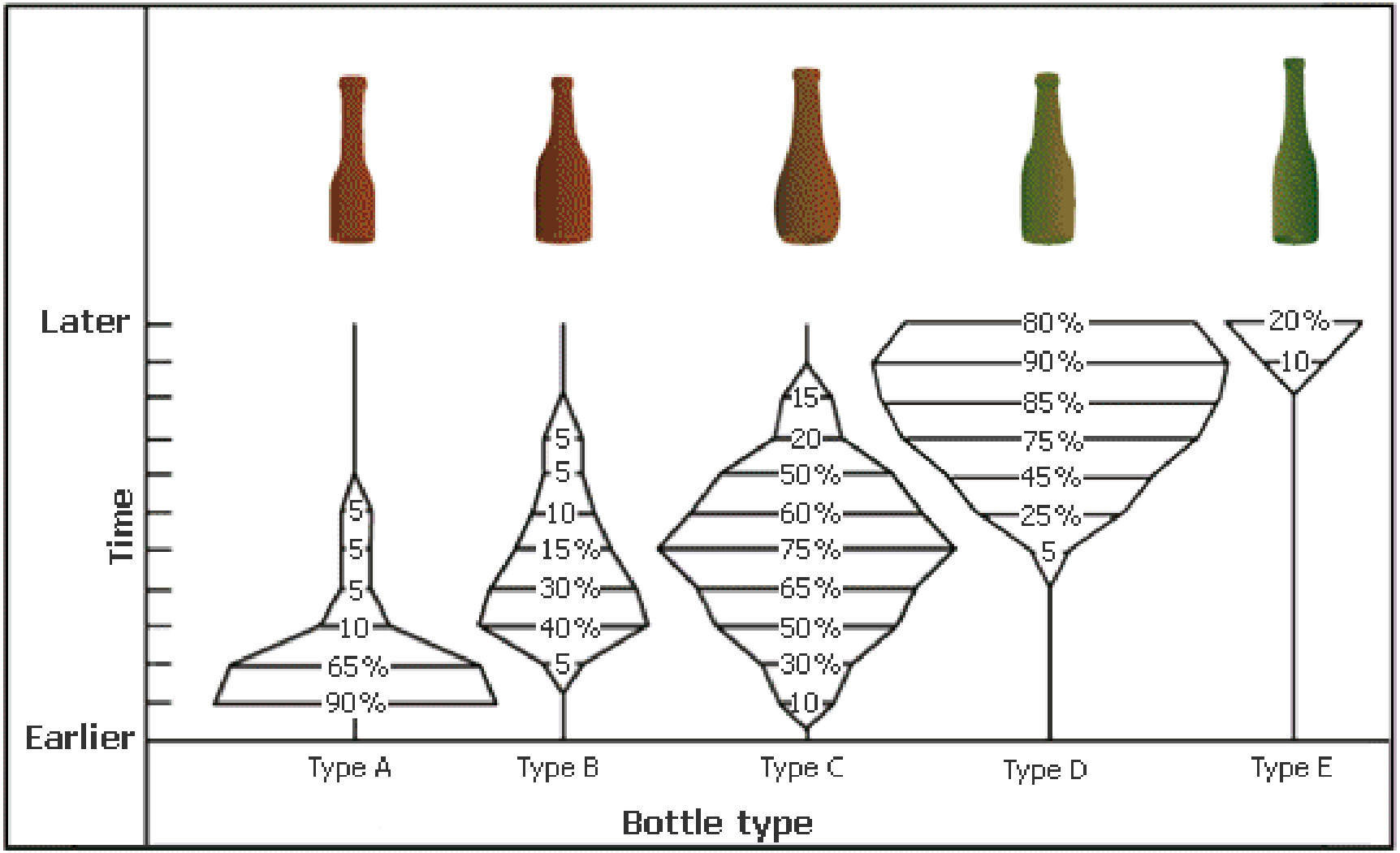
- Each tomb was placed in the order based upon the types and numbers of different types of pottery found in each

- The sections were numbered 30 to 80 and called Sequence Dates (S.D.)
- S.D. 79 is the beginning of the First Dynasty.
- The numbers before S.D. 30 were left for any future discoveries of earlier material

- Petrie's Naqada pottery sequence allowed him to establish a relative chronology for Predynastic Egypt based upon the changes of pottery styles through time



Frequency seriation



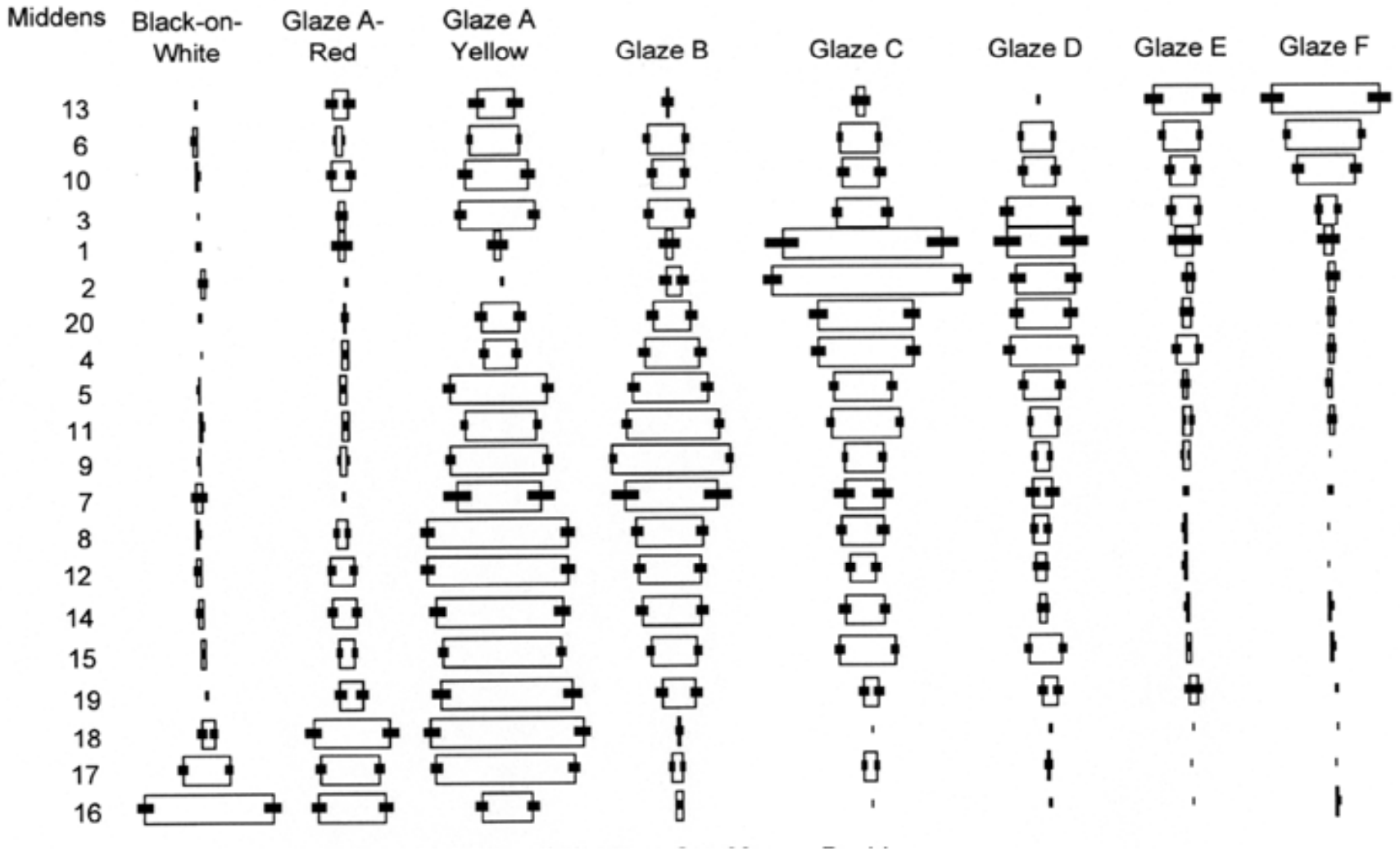
Seriation

2. Frequency seriation: measures changes in the proportional abundance or frequency of an artifact

This concept was pioneered by W.S Robinson and G.W. Brainerd

- They proposed that styles change through time
- Styles may begin, grow in popularity over time and gradually fade away
- They suggested that different sites would have relative frequencies of similar pottery in contemporary phases
- and that placing these in order would allow for the building of relative chronologies between sites

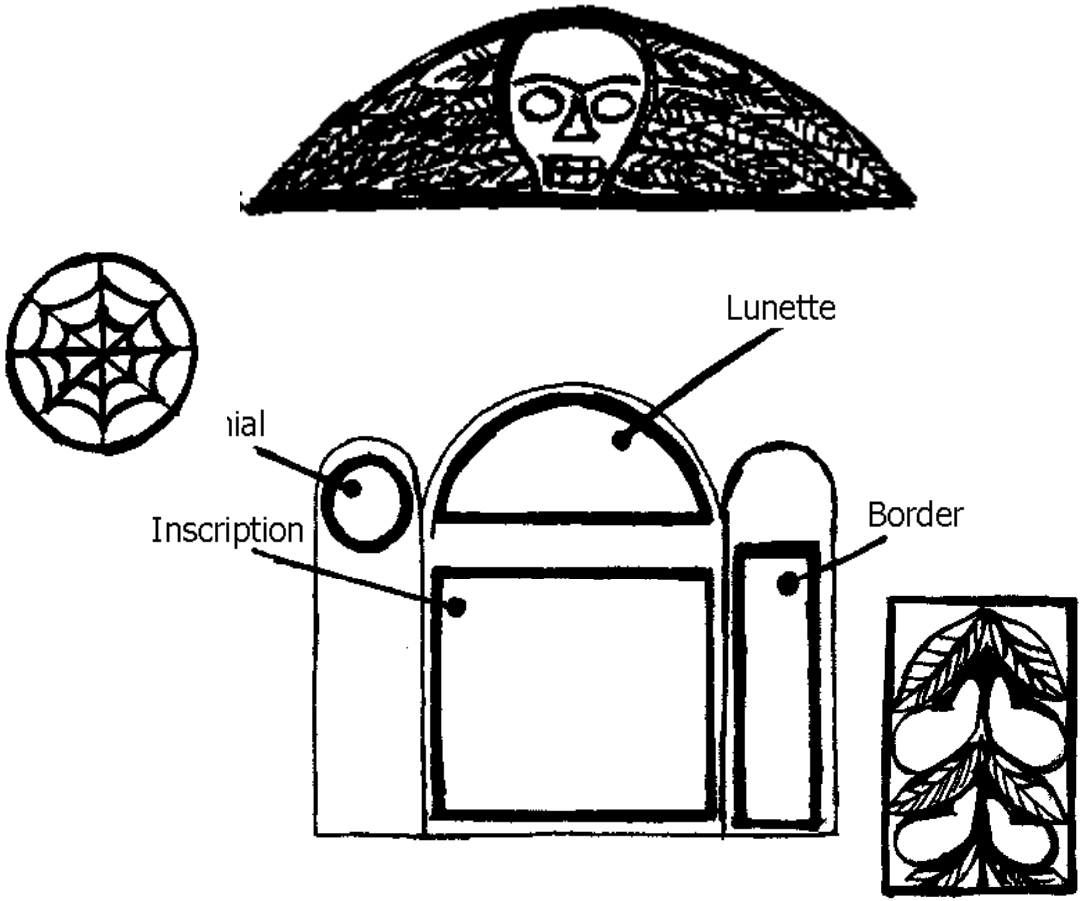
Frequency seriation of middens at San Marcos Pueblo based on pottery decorative style changes



Frequency seriation

- the placing of artifacts or styles in a sequence which reflects the growth of popularity and eventual decline, produces particular patterning in the graphic representation of the percentages of artifacts or styles
- These are referred to as ‘battleship curves’
- However this type of seriation only provides a relative positioning, and does not directly tell us which end of a given sequence is first or last

New England tombstones through time



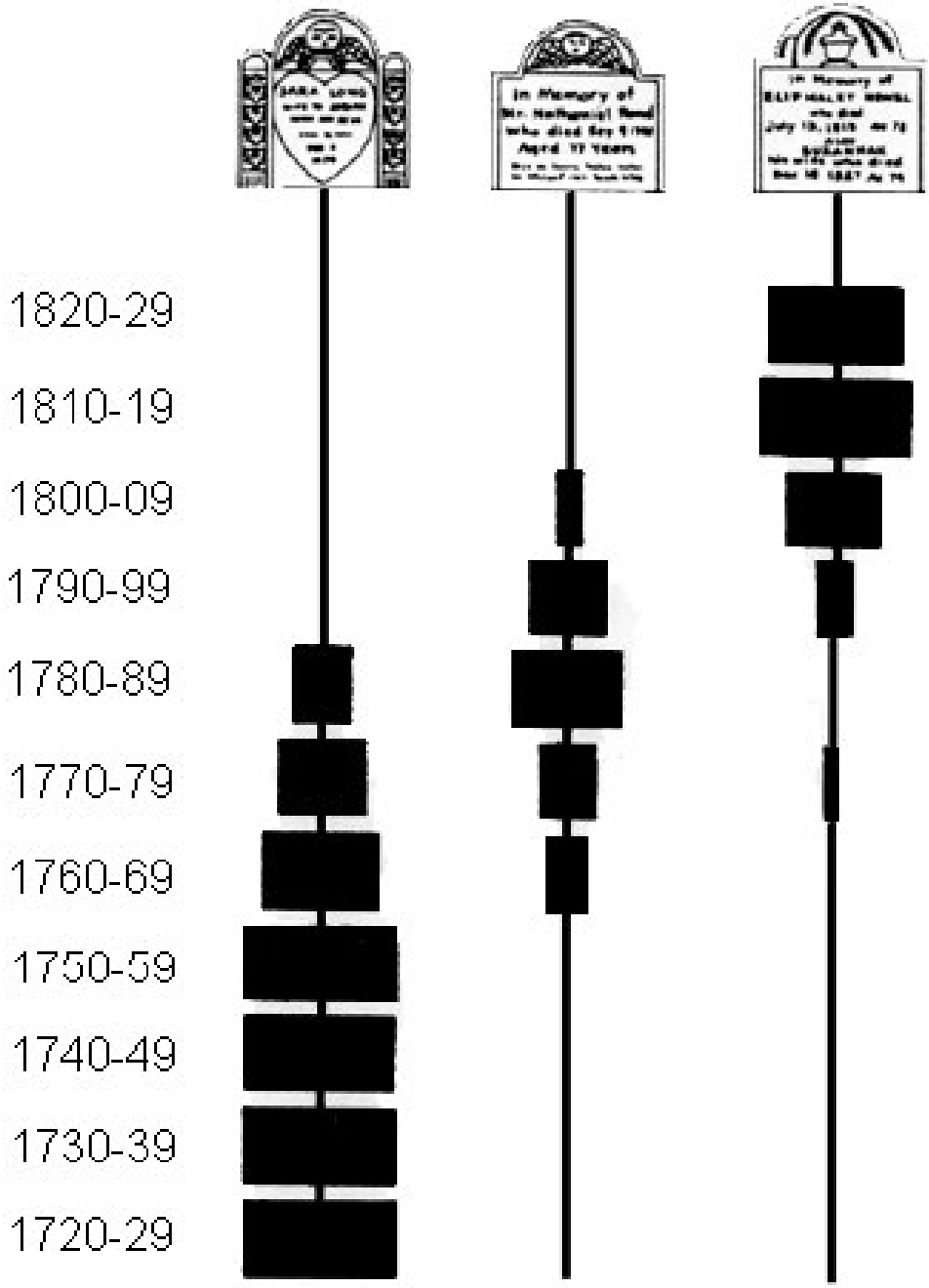
James Deetz and Edwin S. Dethlefsen

Death's Head, Cherub, Urn and Willow

***Natural History* Vol. 76(3) 1967, pp. 29-37**

- They looked at stylistic change through time in tombstones from New England cemeteries
- The cemeteries dates from the late 17th century through the mid 19th century
- Changes in time in the style and decoration of the tombstones can be tracked by reference to the date of death of each individual on the tombstone

Deaths head → Cherub → Willow and Urn



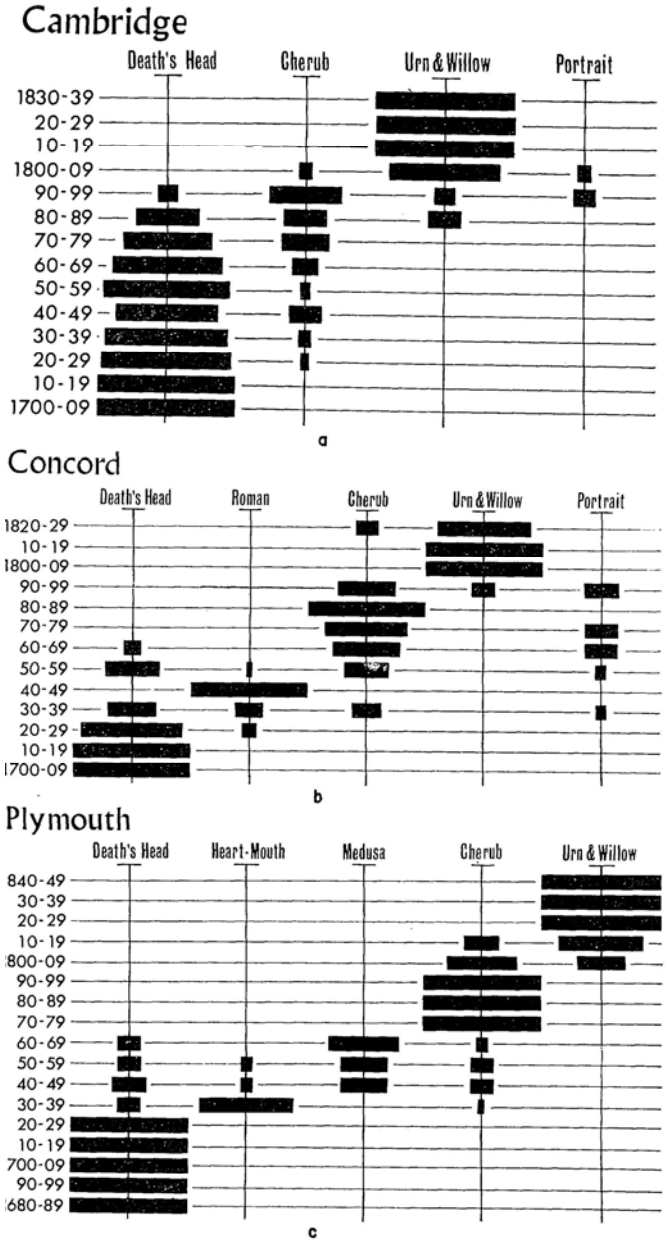
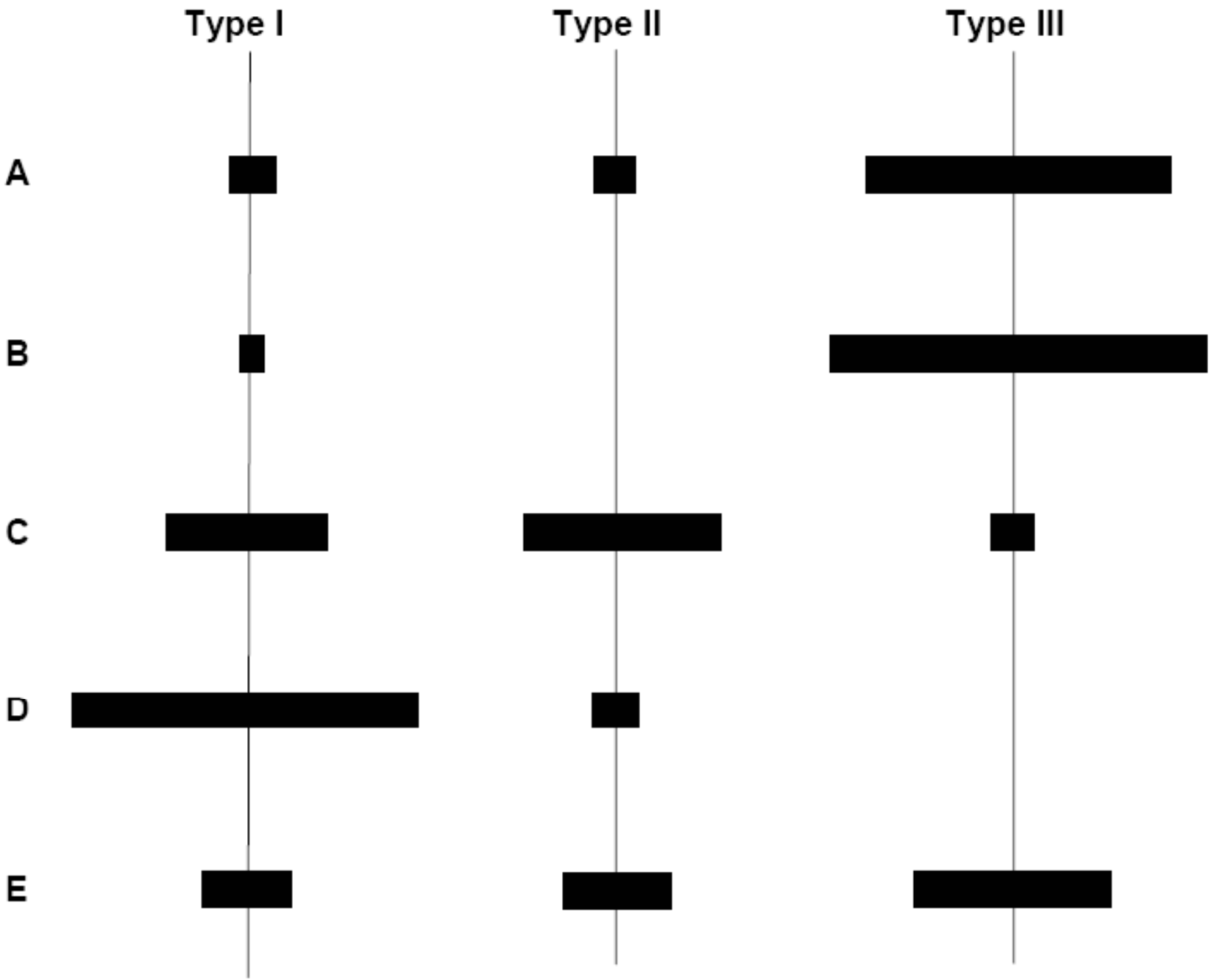


FIG. 3. Graphs showing stylistic sequences in three cemeteries.

How to seriate artifact collections

You have a collection of ceramics from each of 5 sites (Sites A, B, C, D, E). Three distinct types of ceramics are present (Types I, II, III). The table below lists, for each site, the percentage of sherds that were of Type I, II, and III.

	Type I	Type II	Type III	Total for the site
Site A	10%	10%	80%	100%
Site B	5	0	95	100%
Site C	40	50	10	100%
Site D	90	10	0	100%
Site E	20	30	50	100%


Type I
Type II
Type III
A
B
C
D
E

The diagram in the next slide presents these data in graphical form.

Each row of bars represents one site.

On each row the percentages of each pottery type are represented by a horizontal bar. The length of each bar is proportional to the percentage of that type.

To seriate these five sites, arrange the strips of paper so that the popularity of each type either (a) smoothly decreases in popularity, (b) smoothly increases in popularity, or (c) smoothly increases to a maximum popularity and then smoothly decreases.

Solution (or inverted)