SERIATION: ORDERING ARCHAEOLOGICAL EVIDENCE BY STYLISTIC DIFFERENCES

During the early stages of archaeological research in a given region, archaeologists often encounter objects or assemblages of objects that lack stratified contexts. These might include such materials as isolated objects, the objects found in isolated caches or graves, or archaeological sites composed of a single depositional unit. Such materials present archaeologists with a problem. They need to be able to situate them relative to the sequence of cultural units defined from excavations in stratified sites or with cultural units whose antiquity and duration may be known from associated absolute dates. The difficulty is compounded if the cultural sequence defined stratigraphically is incomplete—that is, if there are gaps or unconformities in the cultural sequences established at the excavated sites. Various factors can produce the gaps. Sometimes people moved away for an undetermined period of time before returning; in other instances, it is simply a matter of where on the site the archaeologists chose to locate their excavations.

Archaeologists can situate materials relative to the cultural sequence if they can establish their identity with materials found in a particular unit. If there are gaps in the sequence, then they have to employ a seriational argument to situate the materials. *Seriation* is a technique that involves arranging archaeological materials into a sequence on the basis of some technique other than the law of superposition (Sharer and Ashmore 2003:313–19). The

materials can range from individual objects of the same kind—such as pottery bowls, tapestry shirts, or chipped stone projectile points—to entire archaeological assemblages—such as grave lots, or the objects and associations found in a single stratum. Seriations can be established by a number of different techniques (Cowgill 1972; Marquardt 1978; Rouse 1967). The major premise underlying all of the techniques is that, under most conditions, cultural and stylistic change is a gradual process. Consequently, objects or assemblages that are more like one another will be closer together in the sequence (and in age) than those that are less similar to each other—and are, therefore, farther apart in time (Rowe 1961).

Seriational arguments are frequently used in archaeology. They have a high degree of credibility when certain conditions are satisfied. First, the objects or assemblages being seriated should belong to the same cultural tradition. Since seriational techniques are based on the assumption that stylistic change is gradual, it is not reasonable to use data from different cultural traditions and regions to establish a single sequence. Second, the materials being seriated should come from a relatively restricted geographical region to eliminate or reduce the possibility of contemporary variation due to social factors, or to lags in the spread of features from one part of the area to another (Deetz and Dethlefsen 1965; Dunnell 1970). Third, it is important to recognize situations that can produce sudden changes in the cultural and stylistic traditions of a region; these can range from the purely mechanical situation of a break in the local sequence, so that the objects or assemblages following the gap in time bear no resemblance to those preceding it, to cultural factors—for example, strong outside influences that appear suddenly and swamp the local tradition, or a deliberate attempt to revive or imitate earlier features (Cowgill 1972:384; Rowe 1961:326–27). Fourth, since no assumption is made about the direction in which change is taking place, it is essential to establish the proper chronological order of the sequence by referring to some kind of external evidence—such as superposition or the presence of datable objects in the seriation. When seriating archaeological materials, be they sets of individual objects or entire assemblages, it is useful to view each object or assemblage as being composed of a number of features. For instance, features that might appear on a pottery bottle would be the overall shape of the vessel, the proportions and shape of the neck and spout with respect to the body, the area of the vessel that is decorated, the kind of decoration that is used, and the particular designs that occur.

As an example of one seriational technique, consider three of the many features that might occur on five pottery bottles from the same local area: the height of the neck, the location of the painted design on the vessel, and the

color or colors used to paint the design. Bottle 1 has a tall neck and red-painted decoration on the neck. Bottle 2 has a tall neck and red-painted decoration on the body. Bottle 3 has a short neck and green-painted decoration on the body. Bottle 4 has a tall neck and red-and-blue-painted decoration on the body. Bottle 5 has a short neck and blue-and-green-painted decoration on the body. A convenient way to seriate objects is to arrange them so that each feature being examined has a continuous distribution and an overlapping distribution with other features. For example, Bottles 1, 2, and 4 have tall necks, whereas 3 and 5 have short ones. Bottle 1 is the only one with a decorated neck, and it and Bottle 2 are the only ones with exclusively red-painted decoration. Vessels 2 through 5 have decorated bodies and plain necks. Bottles 2 and 4 are the only ones with the combination of tall necks and decorated bodies with red- or red-and-blue-painted bodies. Bottles 4 and 5 are the only ones with blue-painted bodies. Bottles 5 and 3 are the only ones with green paint. If we arrange the bottles so that each feature has a continuous distribution, then the sequence is 1, 2, 4, 5, 3. This can be shown graphically in a matrix (Table 2).

Table 2

	Time				
Feature	**Bottle 1**	**2**	**4**	**5**	**3**
Neck decorated	x				
Red paint exclusively	x	x			
Tall neck	x	x	x		
Body painted		x	x	x	x
Red and blue paint			x		
Blue paint in some combinations			x	x	
Short neck				x	x
Blue and green paint				x	
Green paint					x

In this matrix, each feature has a continuous distribution. This fits the assumption underlying seriational techniques that change is gradual; other sequences do not fulfill this condition. There are two ways of increasing the reliability of such a seriation. One is to examine many more features on the bottles—for example, the kinds of painted designs that occur or the differences in shape and proportion that exist—and to include these observations in the matrix. The other is to expand the size of the sample, so that ten, fifty, or a hundred bottles from the same local area are examined instead of five. Of course, outside information is still needed to determine the chronological order of the sequence and to establish the age of the different units.

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THE DATA AND THE PROBLEM

The twelve stirrup spout bottles illustrated in Figures 2A through 2L were excavated in a single cemetery. Radiocarbon measurement on organic materials found associated with individuals buried in the cemetery ranged from 3800 ± 200 years to 2600 ± 100 years, suggesting that the cemetery was used over a period of about one thousand years, and that the stirrup bottles from different tombs might have different ages. Each of the tombs excavated contained a single stirrup spout bottle. The tomb containing the vessel illustrated in Figure 2L had been dug into the shaft of a tomb containing the vessel illustrated in Figure 2B. The law of superposition, which was discussed in Problem 1, says that the materials deposited first are older than those deposited later; consequently, the bottle represented in Figure 2B is older than that illustrated in Figure 2L.

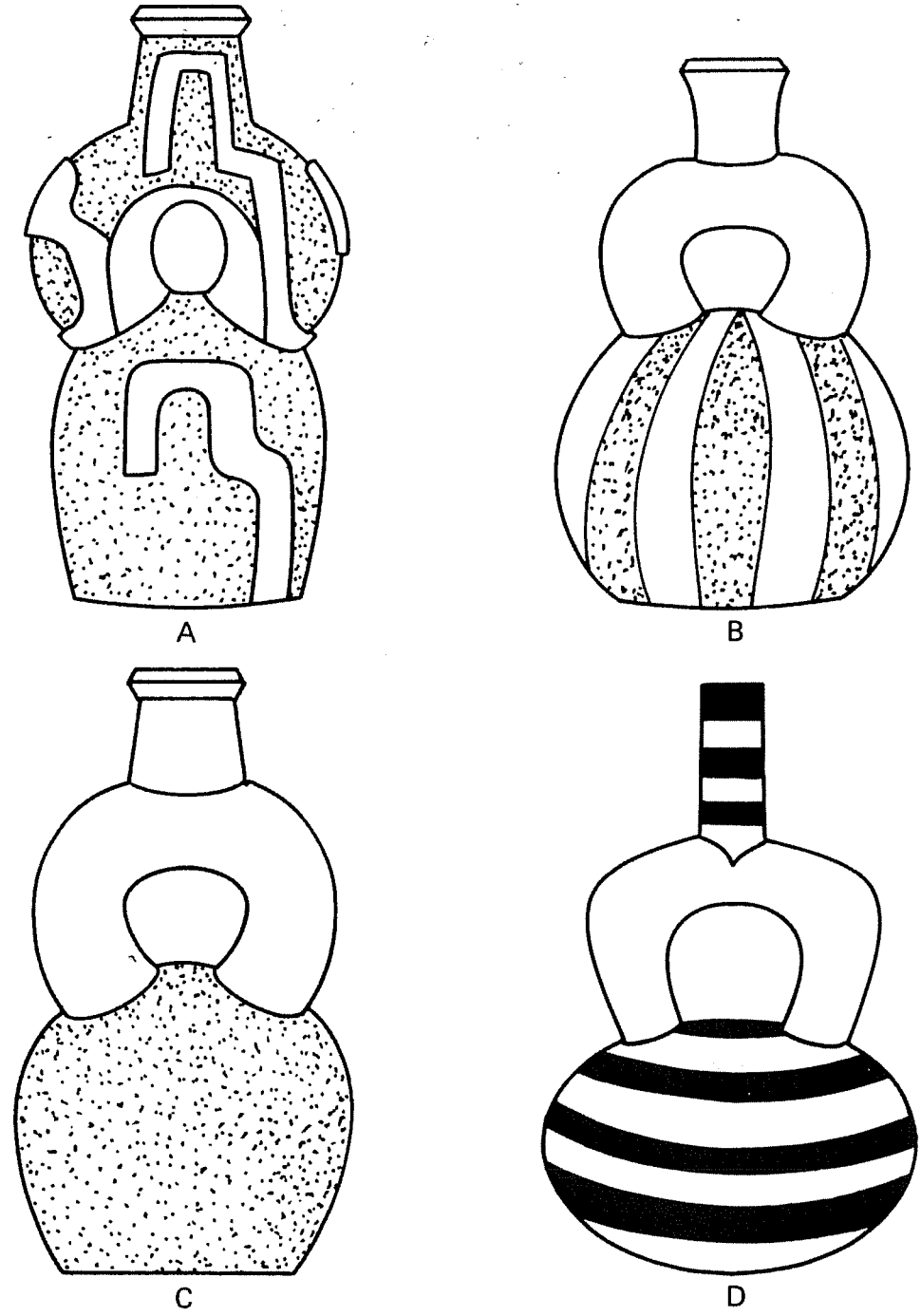

Figure 2

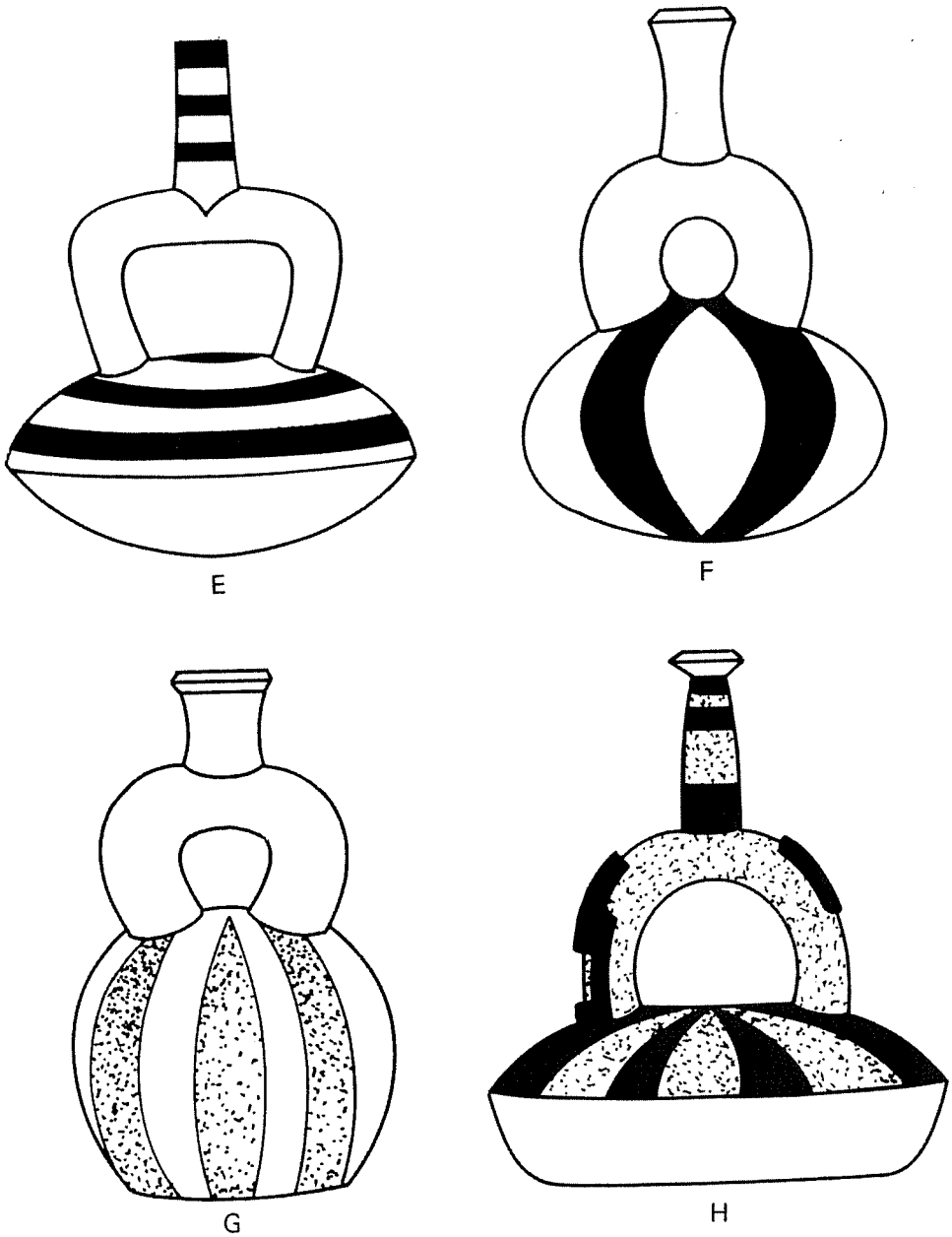

Figure 2 *(continued)*

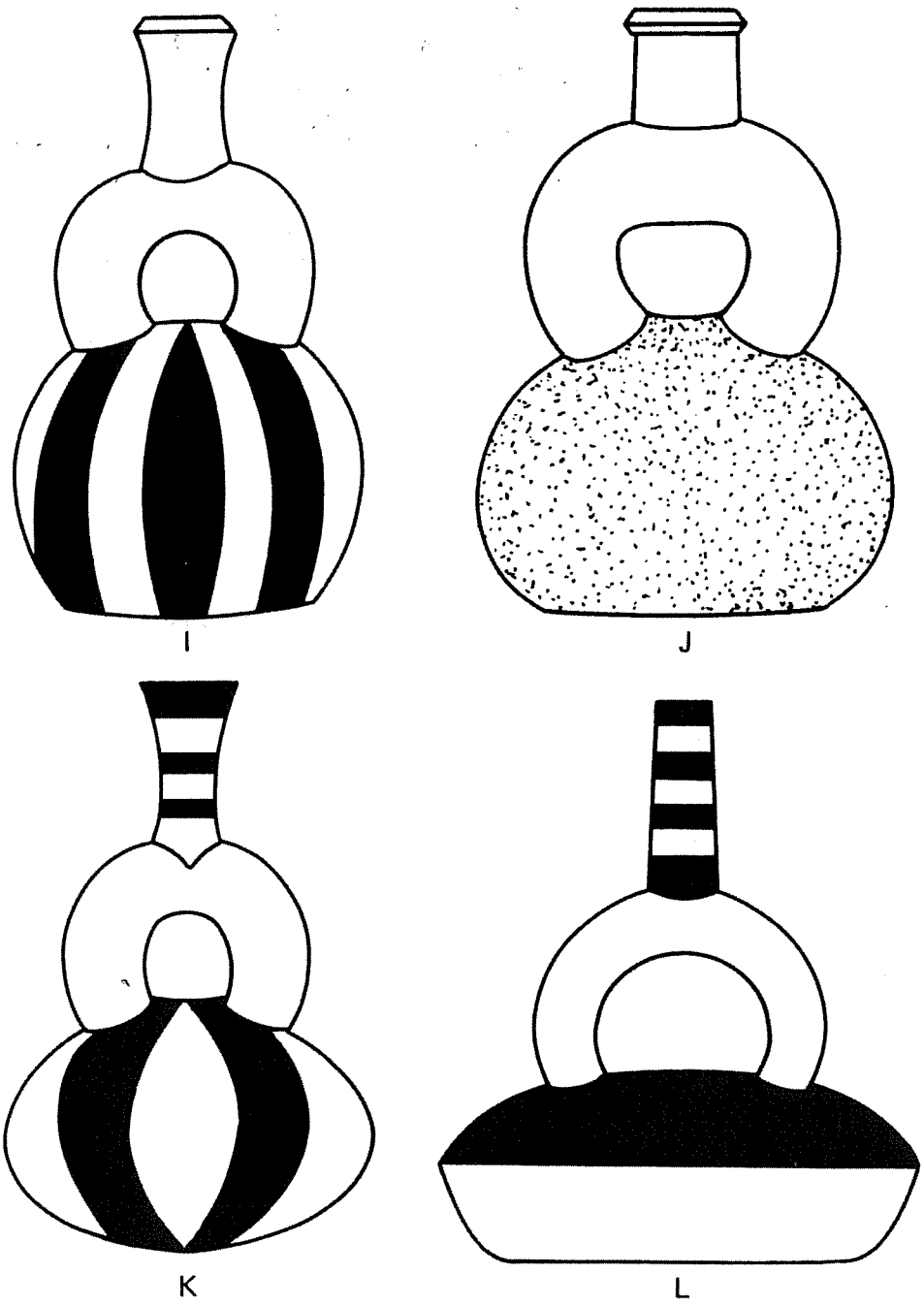

Figure 2 *(continued)*

A brief description of the chronologically significant features of each of the twelve bottles follows. Keep in mind the old saying that a picture is worth a thousand words, and refer to the illustrations.

Figure 2A Vessel with short, massive conical spout with flanged rim; massive rounded stirrup; convex-curved body with flat bottom; appliqué and punctate decoration over the entire surface of the vessel.

Figure 2B Vessel with short, massive concave-curved spout with beveled rim; massive rounded stirrup; markedly convex-curved body with flat bottom; vertical bands of zoned punctate decoration alternating with undecorated bands on the body of the vessel; no decoration on either the stirrup or the spout.

Figure 2C Vessel with short, massive conical spout with flanged rim; massive rounded stirrup; convex-curved body with flat bottom; punctate decoration over the entire body of the vessel; no decoration on the stirrup or the spout.

Figure 2D Vessel with tall, straight-sided spout, narrow triangular stirrup; markedly convex-curved body with rounded bottom; circumferential bands of red paint alternating with undecorated bands on the spout and the body; no decoration on the stirrup.

Figure 2E Vessel with tall, straight-sided spout; narrow triangular stirrup; body has a low profile and a marked shoulder angle mid-height; circumferential bands of red paint alternating with undecorated bands on the spout and the portion of the body above shoulder angle.

Figure 2F Vessel with relatively massive, tall, concave-curved spout with beveled rim; massive rounded stirrup; markedly convex-curved body with rounded bottom; vertical bands of red paint alternating with undecorated bands on the body of the vessel; no decoration on either the stirrup or the spout.

Figure 2G Vessel with short, massive, rounded concave-curved spout with flanged rim; massive stirrup; markedly convex-curved body with flat bottom; vertical bands of zoned punctate decoration alternating with undecorated bands on the body; no decoration on either the stirrup or the spout.

Figure 2H Vessel with tall, narrow, conical spout with flanged rim; tall, narrow, rounded stirrups; cupcake-shaped body with marked shoulder angle and flattened bottom; appliqué and punctate decoration on the stirrup; circumferential bands of red paint alternating with bands of punctation on the spout; vertical bands of red paint alternating with bands of punctation on the portion of the body above the shoulder angle.

Figure 2I Vessel with relatively massive, tall, concave-curved spout with beveled rim; massive rounded stirrup; markedly convex-curved body with flat bottom; vertical bands of red paint alternating with undecorated bands on the body; no decoration on either the stirrup or the spout.

Figure 2J Vessel with massive, straight-sided spout with flat rim; massive rounded stirrup; markedly convex-curved body with rounded bottom; punctate decoration over the entire body of the vessel; no decoration on either the stirrup or the spout.

Figure 2K Vessel with tall, concave-curved spout with flat rim; rounded stirrup; markedly convex-curved body with rounded bottom; circumferential bands of red paint alternating with undecorated bands on the spout; vertical red-painted bands alternating with undecorated bands on the body; no decoration on the stirrup.

Figure 2L Vessel with tall, narrow, conical spout; tall, narrow, rounded stirrup; cupcake-shaped body with marked shoulder angle and flattened bottom; circumferential bands of red paint alternating with undecorated bands on the spout; red paint over the entire surface of the body above the shoulder angle; no decoration on the stirrup.

Assuming that the art style used in the cemetery was relatively homogeneous at any given moment, and using the seriation technique described earlier (as well as the stratigraphic evidence that is available), arrange the stirrup spout bottles into a chronological sequence, beginning with the earliest vessel and ending with the most recent. Pay attention to the illustrations and to the distribution of features—such as the proportions of the body, neck, and stirrup; and the kind of decoration, where it occurs on the vessels, and whether it is oriented vertically or circumferentially.

- Is there any vessel that does not seem to fit into the sequence?
- If so, how do you account for that?
- Does it have any features that indicate when it was actually made relative to the other bottles and where it belongs in the sequence?
- How does the seriational ordering you established correspond to the cultural sequence revealed by the stratigraphic excavation in Problem 1?