

# Symmetries of Culture

## Theory and Practice of Plane Pattern Analysis



Dorothy K. Washburn / Donald W. Crowe

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*Theory and Practice  
of Plane Pattern Analysis*

**Dorothy K. Washburn  
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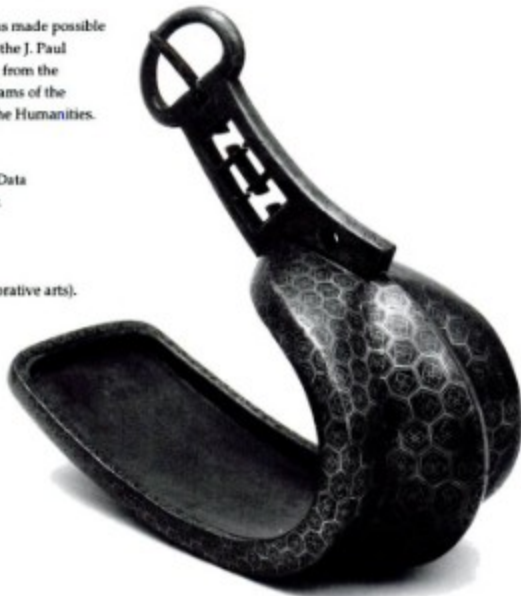
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Loincloth, Charcay style (Fig. 5.1, detail)

as in a language grammar. Thus, classificatory replication among investigators is assured and systematic comparison among data sets is possible.

Symmetry classification is also superior to typological classifications because the classification of designs by their symmetries, like the classification of objects by their color, focuses on only one attribute. By isolating one attribute and studying the persistence and/or change in that attribute we can more systematically determine the actual behavior(s) which relate to these patterns. In contrast, a type encompasses a number of attributes and is thus a bundle of different kinds of cultural information. The combination of all these different behaviors in one analytical unit makes it extremely difficult to use this unit to study any one of the activities encompassed in the type. Further, because the typological process involves subjective judgments, it does not produce replicable results among investigators for a given body of data. This problem renders comparative studies noncomparable and thus of limited value (cf. Washburn 1984).

It should be pointed out here that symmetry classifications do not address developmental issues or issues of cultural complexity. They describe the way a pattern is organized, not whether one pattern is more or less complex than another. Geometers do not consider one kind of symmetry more or less complex or higher on a hierarchical scale than another symmetry. Symmetries are different; they are not more or less complex.

Such confusion about what symmetry means is seen in the work of J. L. Fischer, where he correlated "designs repetitive of a number of rather simple elements" with "egalitarian societies," and "designs integrating a number of unlike elements" with "hierarchical societies." Since Fischer considered that symmetrical designs were a "special case of repetition," he correlated these with egalitarian societies. Conversely, he claimed that "asymmetrical designs should characterize the hierarchical societies" (1961:81).

These correlations are both simplistic and ethnocentric. In the first place, many examples can be cited where they do not exist. For example, the incredibly sophisticated colored patterns with two-dimensional symmetries on pre-Columbian Peruvian textiles were produced by the many empires along the coast of Peru—societies hardly to be classified as egalitarian. In fact, most designs produced by most societies are symmetrical, whether the societies are egalitarian or hierarchical. While one might expect, given the systematic nature of culture, to find "formal themes" (Armstrong 1971:33), that is, modes of organization, in the many facets of culture—music, dance, narrative, design—and even that some of these structures mirror organizational modes in house form or village layout, this is not the same as proposing that all symmetrical designs are produced by egalitarian societies while asymmetrical designs are produced by complex, hierarchical societies.

In the second place, Fischer has assumed that symmetry is synonymous with bilateral mirror reflection. We have shown (1.4.2) how this mistake has also been

made by experimental psychologists who have tested white, middle-class, American college sophomores for preferences among symmetrical patterns: the “symmetrical patterns” were geometrical shapes arranged in bilateral symmetry, and the “asymmetrical patterns” were composed of repeated shapes (actually patterns with translation symmetry). This Western preference for bilateral mirror reflection has obscured the fact that other cultures may prefer other kinds of symmetry and may perceive only these as “symmetrical.”

With our presentation in this book of a more complete definition of symmetry classes in the plane it is clear that such simplistic correlations cannot be sustained. We have shown in the examples cited that different societies do choose and use different symmetries preferentially to structure their patterns. No longer can we sustain such simplistic either/or correlations of “symmetry” (bilateral) vs. “asymmetry” (repetition).

The analysis of design structure by the symmetries which generate the pattern is a replicable, objective way of describing pattern arrangement. Since pattern arrangement appears to reflect culturally meaningful patterns of behavior, then a systematic way of describing and studying this arrangement should be the first order of business for the archaeologist or any other investigator studying design. This analytical tool not only isolates an attribute which has been shown to be culturally significant, but also measures it systematically.

#### 1.4.4 Systematic Classifications: The First Step in Theory Building

In this section we explain why the use of systematic classificatory units and procedures must be first, foremost, and fundamental to research. We take as our model the pure sciences, for from them we can learn the importance of defining the problem and isolating and classifying systematically the units to be used in analyzing the problem. One of the clearest discussions of this problem-solving arena specifically written for social scientists can be found in the first section of Dunnell’s *Systematics in Prehistory* (1971).

Dunnell observes that the pure sciences are the Western “folk theories” of the phenomenological world (1971:13). For example, biologists developed a system, the Linnaean taxonomy, to organize and describe the changes in the various kinds of life forms. Likewise, crystallographers developed the series of symmetry classes to systematically describe the different crystal structures in minerals. Both of these classificatory schemes are “folk taxonomies” in the sense that they were developed by a particular group of people (Western scientists) in order to facilitate exploration of specific problems—the evolution of life and the properties of matter.

There is nothing inherently final or exclusive about these classifications. They