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Various archaeological site designation systems have been designed for use in the United States but none exists for Latin America. A comprehensive Latin American system has not been needed until recently because many regions were archaeological *terra incognita* and relatively few sites were known. The increased tempo of research within the past two decades has multiplied the number of known sites. This is particularly true where intensive areal surveys have been conducted; examples include the Virú Valley, Peru; Teotihuacan and Oaxaca Valleys, Mexico; and the Belize River Valley, Belize. Each project has traditionally developed its own site designation system. The increasing popularity of such projects makes a comprehensive designation system a necessity.

The proposed system is a variation of the Smithsonian Institution-River Basin Survey system used in the United States. It consists of four nomials, corresponding to: 1. country, 2. state or department, 3. local political unit and, 4. site number. The first nomial is a three letter national designation (Fig. 1). The second component is a subnational political division, either a state or department, and is indicated by the first three letters of the division name. The third component is a basic political division, such as a *municipio*, also designated by three letters. The fourth is the site number within the local political unit. Sites would be numbered consecutively as discovered or reported. Thus a typical designation would be Mex-Hid-Tul-1 (Mexico–state of Hidalgo–*municipio* of Tula–site No. 0001).

Abbreviations and letters are preferable to numbers because they avoid the necessity of memorizing long lists of names and number equivalents (see Heizer, AMER. ANT. 33:254, 1968) and permit immediate identification of the country and subdivisions.

The system avoids confusion resulting from similar names for different sites. It also facilitates cross-referencing sites which lie in different countries but within single culture areas such as Mesoamerica, Amazonia, or the Caribbean lowlands.

Argentina	Arg
Bahamas	Bah
Barbados	Bar
Belize	Bel
Bolivia	Bol
Brazil	Bra
Cayman Islands	CIs
Chile	Chi
Colombia	Col
Costa Rica	CRi
Cuba	Cub
Dominican Republic	DRe
Ecuador	Ecu
El Salvador	ElS
French Guiana	FrG
Guadelupe	Gud
Guatemala	Gut
Guayama	Guy
Haiti	Hai
Honduras	Hon
Jamaica	Jam
Leeward Islands	LIs
Martinique	Mar
Mexico	Mex
Nicaragua	Nic
Panama	Pan
Paraguay	Par
Peru	Per
Surinam	Sur
Trinidad	Tri
Uruguay	Uru
Venezuela	Ven
Windward Islands	WIs

Fig. 1. Proposed letter designations for Latin American nations.

A QUANTITATIVE LAW IN ANTHROPOLOGY

ROBERT L. CARNEIRO

ABSTRACT

The contention by Donn T. Bayard that anthropology is not rigorous enough to be a science or to formulate scientific laws is challenged, and an example is presented of a regularity in cultural evolution with a claim to being considered a statistical law.

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In a recent article, Donn T. Bayard (AMER. ANT. 34:376-384, 1969) criticizes the "new archaeologists" for viewing their profession as a "science" instead of as a "discipline." Archaeology, Bayard contends, cannot be a science because it lacks concepts with the rigor and precision characteristic of science. And without rigorous concepts, the notion that we can formulate quantitative laws in archaeology, or anthropology, is completely illusory.

Although not an archaeologist myself, I am nevertheless one of the targets of Bayard's attack. He identifies me–correctly–as one of "those who have been influenced by the cultural evolutionary theories of Leslie White" (p. 377), a group he seems to consider the real instigators of the "new archaeology."

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But Bayard does more than simply list me as a co-conspirator. He cites my work on cultural evolution as exemplifying the inexactitude and unsoundness he attributes to the "new archaeology" and related approaches. Referring to the traits "agriculture," "social stratification," and "political state," which appeared in an early paper of mine on scale analysis and evolution (SWJA 18:149-169, 1962) Bayard decries the use of categories so gross and imprecise as these. He takes such usage to be further evidence that anthropology can never rise to the level of science.

What Bayard fails to note, however, is that these categories were used by me merely as labels on a scalogram intended to show the workings of scale analysis generally. They certainly are not the categories I used in actually applying scale analysis to cultural evolution. Had Bayard been interested in the substantive results of this work, and had he bothered to look into it further, he would have found that the traits employed in it were formulated with considerable exactness (Carneiro, SWJA 24:354n, 1968). Thus, the "political state," whose vagueness bothered Bayard, is actually defined by me as follows:

> State: permanent organization of a number of supra-community units (districts, tribes, or provinces) into a single political unit under centralized control, involving at least (a) some power to collect revenue, (b) the power to conscript men for work or war, (c) some centralized judicial authority, and (d) the power to formulate and execute policy.

This, I submit, is no mere rubric. And the other traits used in the study were defined with a similar attempt at precision.

A second argument raised by Bayard against the possibility of scientific anthropology is the supposed lack of a sufficient number of cases upon which to base our generalizations. While the number of molecules of air in an average-sized room (some 10^{27}) is sufficient to allow us to formulate statistical laws about gases, Bayard says, the 4,000 or so human societies is insufficient to allow us to formulate laws about cultures. Consequently, he concludes, "rigorous statistical laws. . .cannot be developed for anthropology at present. . ." (p. 377).

I would argue just the opposite. It seems to me that 4,000 cases *are* sufficient to formulate statistical laws of culture. Indeed, even a hundred are enough to reveal genuine and unmistakable regularities. Moreover, statistical laws of culture are not only possible, but have already been formulated. One such law, for example, emerged during the course of my work on cultural evolution, and has been published elsewhere (Carneiro 1968:363). Had Bayard taken the trouble to familiarize himself with the work he was criticizing, it would be unnecessary for me now to bring this law to his attention.

Before presenting the law, though, some background needs to be provided. My main objective in applying scale analysis to cultural evolution was to see if a sequence of traits existed which most societies had followed most of the time. Such a sequence of traits was, in fact, found to exist, and was published several years ago (Carneiro and Tobias, TRANS. N.Y. ACAD. SCI., Ser. II, Vol. 26:196-207, 1963). Now a sequence is not a law. But the sequence referred to, when looked at in a certain way, revealed a regularity which I would say *is* a law. Let us examine this regularity.

The evolutionary sequence involved comprises 50 traits which the 100 societies in our sample developed in much the same order. But although the overall regularity of the sequence is great, it is not perfect. There are deviations from it. To put the matter schematically, Trait A, which appeared before Trait B in most societies, did not do so in all. In some societies B preceded A. The interesting thing about these deviations, though, is that they were not random, but patterned. The pattern was not immediately evident, but once discovered, it could be brought out and demonstrated very clearly (Carneiro 1968:360, 367). Thus, while we cannot predict the exact behavior of each trait in the sequence, we do find a predictable regularity in the behavior of aggregates of traits. And this regularity I would not hesitate to call a *statistical law*.

A full presentation of this law requires several pages, and can be found in Carneiro (1968:358-363). However, it can be summarized briefly here. The regularity is this: The closer together two traits are in a general evolutionary sequence, the greater the likelihood that in a given society the relative order of development of these two traits will be reversed. And conversely, the further apart two traits are in a general sequence, the less the

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likelihood that in a particular society there will be a reversal of this order.

A concrete example may make this relationship clearer. Among societies generally, the "corvée" appears to develop before "full-time craft specialists." The evolutionary distance between these two traits, however, is small. That is to say, the latter trait seems to arise shortly after the former. Or, to put it more precisely, relatively few traits intervene between the appearance of the "corvée" and the appearance of "full-time craft specialists."

Among the 12 test cases we have for comparing the relative development of these two traits, the "corvée" precedes "full-time craft specialists" in 58% of the cases, while "full-time craft specialists" precede the "corvée" in 42%. Thus, for these two traits, which are relatively close in evolutionary distance, the later one in the general sequence nevertheless develops before the earlier one fairly frequently. And for some pairs of traits that are even closer together in evolution, especially those that follow each other directly in the sequence, which of the two arises first in a given society may be, statistically speaking, almost a matter of chance.

On the other hand, if we examine traits at opposite ends of the sequence, such as "empire" and "special religious practitioners"—that is to say, traits between which there is great evolutionary distance—we find no exceptions to the general order of development. Thus, among the 88 test cases we have for "special religious practitioners" and "empire," the former arose before the latter 100% of the time.

When we look at pairs of traits at intermediate evolutionary distances, we find intermediate degrees of regularity in development, ranging toward 50% at one end and 100% at the other. Indeed, the magnitudes of the percentages reflect the magnitudes of the evolutionary intervals so closely that the relationship can readily be formulated as a statistical law as follows:

> *The degree of regularity in the relative order of development of any two traits in a sequence is directly proportional to the evolutionary distance between them.*

Is it too presumptuous to call this a statistical law? I think not. Those who think so may perhaps have an exaggerated notion of what a statistical law is. Consider, for example, the well-known statistical law in physics known as Boyle's Law of gases. This law is "statistical" in that it does not predict the behavior of individual molecules of gas, but rather expresses the regularity found in the aggregate behavior of large numbers of molecules. Thus, taking a gas as an aggregate, Boyle's Law states that the volume of a gas is inversely proportional to the pressure. That is to say, the greater the pressure, the smaller the volume, and vice versa. That is all there is to it.

Now is our law relating regularity in the relative development of traits to the evolutionary distance between them any different in form from Boyle's Law? Not at all, except that one expresses a direct proportionality and the other an inverse proportionality. Even the degree of precision in the cultural law turns out to be scarcely less than in the gas law. And if one likes to think of scientific laws as possessing a certain elegance or subtlety, is our cultural law any less elegant or subtle than Boyle's?

Given his predisposition, Bayard may not find in the existence of this cultural law any reason to rejoice. But there it stands for anyone to examine and verify for himself.

If Bayard's bias is to deny the possibility of any laws of culture, my bias is to affirm that there must be others. But in order to find them, we have to look for them. As Henry Thomas Buckle put it so very well in his *History of Civilization in England* more than a century ago,

> In regard to nature, events apparently the most irregular and capricious have been explained, and have been shown to be in accordance with certain fixed and universal laws. This has been done because men of ability, and, above all, men of patient, untiring thought, have studied natural events *with the view of discovering their regularity*: and if human events were subjected to a similar treatment, we have every right to expect similar results" (emphasis mine).

As long as anthropology was practiced as a "discipline" instead of as a "science," few cultural laws were likely to emerge. But now that a growing number of persons, including the "new archaeologists," are making an open and sustained attempt to do so, the prospects of finding and formulating such regularities appear increasingly bright.

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