DIFFUSION AND INDEPENDENT INVENTION: A CRITIQUE OF LOGIC[1]

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THERE exists a large proportion of anthropological data which admits of no clear-cut methodology but is usually handled according to inference and common sense logic. While this method may be soundly rational, the possibility of an enormous subjective element and fallacious logic is ever present and is demonstrated by the existence of the diffusion controversy. This controversy is made possible not only by the personal bias of the investigator but also by a confusion of the principles upon which the solution is based.

It is not my purpose to present a rule-of-thumb method for the settlement of the diffusion controversy but to inquire into its logical implications and discover whether these are not capable of formulation. While this will but formulate the principles implicit in most work, it will also reveal the possibility of certain confusions and inconsistencies.

Certain factors are involved in every instance where there is doubt concerning independent invention or diffusion: the spatial proximity of the localities where the culture element in question occurs, the apparent uniqueness of the element, the possibility of its derivation from a common ancestral culture, and the number of other elements shared by the localities. While all of these are usually taken into consideration through a method of common sense logic, certain of them are frequently ignored or one made to depend upon another in an illogical manner.

This may be illustrated by inverted speech[2] which occurs in North America in the Plains area, California, and the Southwest, and also occurs in Australia. Shall we account for these four occurrences by diffusion or independent invention? The solution depends upon inference from the assembled facts, but what is the

[1] Read at the meeting of the American Anthropological Association, Dec. 28, 1928.

[2] A custom of clowns and others of saying the reverse of what is meant.

logic of our reasoning? We ask: How probable is communication between these areas? How difficult an achievement is inverted speech? It is tempting immediately to postulate diffusion between the North American occurrences but independent invention for Australia. This would be solely on a basis of distribution and by this we should be prone to judge the uniqueness of the element. A consideration of California, the Southwest, and the Plains alone would lead us to regard the invention of this trait as an inherently difficult accomplishment, largely because of the comparative ease of communication between the three areas which it seems to have diffused. But the Australian data, in view of the difficulty of communication between Australia and America, lead us to regard inverted speech as not so difficult an invention after all, for it clearly has been invented a second time. What logical justification would there be for the assumption that independent invention is inherently less possible for the Plains, California, and the Southwest than for Australia because the first three happen to be geographically more accessible?

If we conclude that communication was quite possible between two or more localities possessing the same trait, we are prone to regard the trait as unique. Conversely, if we decide that the trait is not unique and may frequently appear, we are less impressed with the possibility of communication. Thus by disposing of one factor we beg the question for the other. Thus, those who regard all elements as unique and impossible of multiple invention beg the question in favor of the probability of communication everywhere and are called "extreme diffusionists." On the other hand, those who regard all elements as easily arising everywhere, the "evolutionists," beg the question against the probability of communication. Without looking to the extremist, we find that everyone is constantly called upon to make decisions in problems of this kind. Personal bias and a confusion of factors which must logically be kept distinct may affect the solution.

We are concerned here, however, not with reconciling the extremists but in defining the methodology used by unbiased investigators—if there be such—and stating its logical justification.

I therefore submit the following three principles as logically valid formulations of the methodology employed, implicitly or explicitly, in the solution of these problems. These principles are stated in terms of probabilities, and for this I make no apology to scientists for the most exact scientific laws are philosophically but statements of high probabilities.

When a culture element is found in two or more localities (and it is assumed that the element is identical in each case), the probability that independent invention has occurred is:

(1) Directly proportionate to the difficulty of communication between the localities.

(2) Directly proportionate to the uniqueness of the element—the "qualitative criterion."

(3) Inversely proportionate to the probability of derivation from a common ancestral culture.

(1) *The probability of independent invention is directly proportionate to the difficulty of communication between the localities.* The logical validity of this lies in the fact that as communication is difficult, the chance of its having occurred to transport the element is small. Factors determining the difficulty of communication are: geographical accessibility and means of transportation, intertribal relations, and cultural receptivity. These have been clearly discussed by Sapir in his *Time Perspective in Aboriginal Culture.*[3]

A measure of the difficulty of communication is the number of other culture elements shared by the localities. Other things equal, each culture element common to the localities strengthens the probability that communication has occurred. Therefore as a supplement to (1), we may state as

(1*a*): *The probability of independent invention is inversely proportionate to the number of traits shared by the two localities*—the "quantitative criterion."

That culture elements of different types diffuse with varying degrees of facility would be taken into consideration under cultural receptivity and intertribal relations.

A further supplement to (1) is:

(1*b*): *The probability of independent invention is inversely proportionate to the elapsed time since the appearance of the trait in either locality.*

[3] Canada, Department of Mines, Mem. 90 (Anthr. series, no. 13), 1916.

That is, the amount of communication between the localities is, other things equal, a function of time.

(2) *The probability of independent invention is directly proportionate to the uniqueness of the element.* The uniqueness of a culture element—that is, the probability of its being invented—is the most difficult problem to determine. This will be decided by the investigator upon his experience and knowledge of the cultural setting and circumstances under which it may have been invented. But his decision must not depend upon either of the other two principles stated here. To the probability of an element of culture arising in a particular culture, the existence of this element in other localities and the difficulty of communication between the localities are totally irrelevant.

(3) *The probability of independent invention is inversely proportionate to the probability of derivation from a common ancestral culture.* The solution of this depends partly upon the number of other culture elements which the localities have in common so that (*1a*) may also apply here as a possible supplementary principle:

(3*a*): *The probability of derivation from a common ancestral culture is proportionate to the number of elements shared by the localities.*

It also depends upon known factors of racial and linguistic relationship. These have also been discussed by Sapir.[4]

Where one or two of these three principles fails to yield data in terms of probabilities, our inference as to what has occurred must be drawn entirely from the known. Most commonly the unknown will be (2), the possibility of invention of the trait—its uniqueness—and we shall consequently be thrown back upon distributional inferences. Thus, to return to inverted speech, if the possibility of its arising in any culture is totally unknown, we are forced to decide its origin in any locality upon the possibility of its diffusion from another locality also having it or its derivation from a common ancestral culture. This, however, will establish probabilities merely as to whether independent invention or diffusion has occurred in this particular instance and does not

[4] Ibid.

throw light on the problem as to whether or not inverted speech is a trait that is inherently difficult to invent.

The final solution of any problem of this type will rest upon a summation of the probabilities derived from each of these three principles or criteria but the principles themselves must logically be weighted separately without the least interdependence.

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