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## HISTORICAL RECONSTRUCTION OF CULTURE GROWTHS AND ORGANIC EVOLUTION

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THE purpose of this essay is to discuss certain similarities of aim and method in the reconstruction respectively of culture growths by anthropologists and of organic history or "evolution" by biologists.

1. Cultures, especially in their cyclic aspects, have sometimes been compared to organisms. They are however obvious composites: more or less fused aggregates of elements of various origin, ancient and recent, native and foreign. They are therefore more truly similar to faunas and floras, which also are composites or aggregates of constituent animal or plant species which often are of quite diverse origin in space and time; and the aggregate wholes are representative of, or bound to, natural regions. The nearest analogues to culture areas, such as the West African or Southwest American, therefore are faunal areas like the Holarctic or Neotropical; and cultures are comparable to biotas.

Following this comparison further, one may compare species to culture traits or elements, and genera or families to culture trait complexes. It is plain that this analogy must not be pushed too far, especially as concerns its second half. A culture complex often is "polyphyletic;" a genus is, almost by definition, monophyletic. However, the analogy does at least refer to the fact that culture elements like species represent the smallest units of material which the historical anthropologist and biologist respectively have to deal with.

2. Corresponding to relatively stationary or persistent culture traits or complexes like flint chipping, and to retarded cultures like that of Tasmania, there are long persistent and slowly altering groups of animals such as the sharks, and isolated, retarded faunal areas like Australia and New Zealand. Conversely there can be recognized rapidly diffusing or expanding traits and species, and cultures and faunas subject to invasion and marked by change.

3. Distributional phenomena are of equal evidential weight in the two realms. The geographical occurrence of members of the group Cactaceae with its heavy weighting in Mexico and nearly complete restriction to America, for instance, allows of inferences as to the origin and areal history of the group comparable to the inferences generally made as to the origin of maize agriculture, terraced pyramid construction, and associated culture traits in the Middle American region.

In both sciences, geographical continuity greatly strengthens other evidence for relationship. But continuity of present distribution is by no means indispensable to proof of common origin; and conversely, continuity alone does not prove historic relationship, because of the possibility of phenomena of separate origin secondarily acquiring distributions that are continuous.

4. The Age and Area principle seems the same in biology and cultural anthropology. First used decisively in biology, it seems to have been hit upon independently soon after by anthropologists. In essence the principle was already clear to Ratzel, though he dulled the edge of its value as a technique by wavering between populations and cultures in making its applications.

The same limitations and strictures upon the principle hold in the two sciences. It is closely related groups of species or traits that must be compared, not distantly or unrelated ones: copper working with bronze, for instance, a simple with an elaborate complex of weaving techniques; not bronze with mudbrick-building, or a textile art with a religious cult. A botanist would hardly venture to infer respective age from the distribution of grasses and pines. A zoologist would judge age from area within a genus, family, or perhaps order, scarcely as between classes, or between orders belonging to different phyla. In anthropology this limitation has generally not been recognized explicitly, has occasionally not been observed with due caution, and unnecessary attacks upon the principle have resulted.

5. The phenomena of convergence or independent parallel origin, versus relationship by common origin or descent and spread or diffusion, have long been recognized in both groups of sciences, but their discrimination has generally made no serious difficulty in modern biology while it has led to fundamental controversy in anthropology.

Ratzel forty years ago pointed out that the assumption of independent origin of similar cultural phenomena generally involved a falling back upon self-sufficient but vague forces like the "unity of the human mind" which were parallel to the "spontaneous generation" of the older biologists; and that it is historically more productive to test the facts on the assumption of

a tentative working hypothesis of genetic connection. Where similarities are specific and structural and not merely superficially conceptual, this has long been the accepted method of evolutionary and systematic biology. There is no apparent reason why the same point of view should not prevail in historical anthropology. The risk that working hypotheses may now and then be stretched into systems is one that has to be accepted. As an example may be mentioned the rude pottery figurines which are found from western Mexico to Venezuela and Peru and from which as principal evidence there has been reconstructed an Archaic Middle American horizon or type of culture. If the resemblances of these figurines were demonstrated as specific at several points, no one would hesitate to accept them as evidence of the spread of a common culture, in spite of local variations. If however the resemblances are limited to the conceptual ones of use of clay, crude modeling, and human representation, the case for historic unity is obviously unproven, however valuable these resemblances may be as a suggestion or clue.

6. The fundamentally different evidential value of homologous and analogous similarities for determination of historical relationship, that is, genuine systematic or genetic relationship, has long been an axiom in biological science. The distinction has been much less clearly made in anthropology, and rarely explicitly, but holds with equal force. A concept like that of caste, for instance, undoubtedly has a certain logical or psychological validity, but a very dubious historical validity. Conceptually caste constitutes as unassailable a group of phenomena as that represented by the category "shell fish" (molluscs, crustacea, turtles); historically it may be just as meaningless. On the contrary, it is difficult to see only a superficial analogy between the Aztec patolle game and the Hindu pachisi game, long ago analytically compared by Tylor. Their specific structural similarities in two-sided lot throwing, count values dependent on frequency of lot combinations, a cruciform scoring circuit, the killing of opponents' counters that are overtaken, etc., make out a strong case for a true homology and therefore a genetic unity of the two game forms, in spite of their geographical separation. Biologists would almost certainly judge so. On the other hand, the Aztec-Maya and Southeast Asiatic permutation calendars are similar essentially only in the conceptual fact of applying permutation to time counting. Their respective specific content (the name-sequences), their specific numerical structure ( $13 \times 20$  versus  $10 \times 12$ ), in part their function or application in their cultures, are thoroughly different, so that if there is any historic relation at all it must be remote and indirect. On the other hand, if Graebner's attempt to equate the Mexican and Asiatic se-

quences name for name were of a character to compel conviction, a strong point of homology would be established, and therewith a *prima facie* case for historic connection.

In this connection consideration must be given the factor of limited possibilities. There are, for instance, only a few possible types of arrow-release. Recurrences of these in different regions do not accordingly have the same weight as evidence in favor of historical connection, as recurrences in some trait where the possible variations are many. The totality of distributions and especially of associated traits must therefore be scrutinized much more closely before decisions are arrived at. Similarly with standard or regularly used "sacred" numbers. These must almost of necessity be chosen from the numbers between three and twelve. The biological parallel is not exact, but a somewhat similar situation is presented by the limited number of choices which nature has between exo-skeleton, endo-skeleton, and no skeleton.

7. It is the totality of structure which decides relationships between groups of organisms or between culture trait complexes. That some butterflies have only four legs instead of the basic insect pattern of six is of no significance for fundamental relationship, because of the overwhelming identity of structure of these and other butterflies in other respects. The lower number is evidently a secondary phenomenon of reduction, and significant only for sub-classification within the more immediate sphere of relationship. So with a cultural complex which is on the whole a fairly uniform system, like our week, variations are of only secondary moment as long as the essential features of the system recur: a series of seven days named after heavenly bodies or their god-equivalents in a certain sequence. Wherever this set of traits occurs, one cannot doubt direct derivation from a single common source. On the other hand, a market or ritual day recurring every seventh day is by no means necessarily derived from the same source as our week, because the resemblance extends to only part of the features.

There are cases in which it is not a simple matter to decide whether the totality of traits points to a true relationship or to secondary convergence. The ratite birds are an instance in point. It has been held that the ostrich, rhea, emu, etc., form a true group, and again that they represent merely secondary assimilations of originally diverse ancestors. Similarly, the pinnipeds are of doubtful phylogenetic unity. They may be derived from several families of carnivores. Yet few biologists would doubt that sufficiently intensive analysis of structure will ultimately solve such problems of descent as these. There seems no reason why on the whole the same cautious optimism should not prevail in the field of culture; why homologies should not

be positively distinguishable from analogies when analysis of the whole of the phenomena in question has become truly intensive. That such analysis has often been lacking but judgments have nevertheless been rendered, does not invalidate the positive reliability of the method. Masks, secret religious societies, couvade customs, matrilinear institutions, the kingship are a few among many culture-complexes whose history should ultimately be ascertainable with reasonable positiveness, at least in outline. Rivet, Jijón, and Nordenskiöld have definitely shown the extremely high probability of the independent American origin of bronze by taking into consideration all possible associated phenomena, such as the shapes of objects. Without these associated data, the problem would have remained insoluble, other than by mere opinionating.

These remarks do not refute what has been said above in favor of Ratzel's recommendation to consider connection as a possibility in spite of geographic gaps—so long as resemblances are more than conceptual, and so long as any hypothesis remains genuinely tentative and an instrument for further inquiry.

8. Similarly, it must be the totality of constituents which decides relationships between faunas or floras or cultures. These are necessarily always complex, though in varying degree. It may be proved that the Aztecs played a game of Hindu origin and the Mayas sculptured elephants, and yet the bulk of Middle American civilization be a purely native growth. Biologists no longer expect any fauna to have originated wholly in any one remote other region. Neither should anthropologists in regard to a culture. And yet there may be a decisive preponderance. This obviously is expressible only in terms of the totality of species or traits involved.

9. In this connection absences and paucities become important evidence: the total absence of placental mammals from Australia, for instance, especially as coupled with the rarity of marsupials elsewhere. Similarly, the absence from native America of iron, wheels, plows, the usual grains and domestic animals, stringed instruments, ordeals, and proverbs, as pointed out by Boas, indicates strongly that culture in America must have had a history very considerably or prevalently separate from the rest of the world; although such a conclusion leaves some, probably lesser, introductions into America entirely possible, even expectable.

10. Degeneration or simplification is a factor in cultural as well as natural history. Not only can areas become impoverished biotically or culturally, but a system such as a manufacturing technique or sculpture, an alphabet or cult, can degenerate much like an organic group: for instance, the Ascidians, whose simple, regressive structure caused them long to be

excluded from their place among the Chordates. Even the suppression of parts due to parasitism has its cultural parallels: quite probably among the Negritos, and among pastoral nomads in contact with farming and town populations. Rivers' work on the disappearance of useful arts is important in this connection; and Perry and Smith have made out some cases for deterioration which are not the less valuable in themselves because they are used also as arguments for a larger and generally unaccepted scheme.

In the light of the foregoing parallels of biological and cultural method several former and current anthropological theories or points of view appear inadequate when judged by comparable standards in biological science. All explanations of specific culture manifestations as due essentially to the common psychic structure of mankind are about as offhand and antiquated a dismissal of real problems as would be the assumption that organic forms originate spontaneously and independently. Universal schemes of unilinear typological development seem in principle to deserve little if any more consideration than general schemes of unilinear evolution would receive in biology. The Smith-Perry view that substantially all higher civilization is due to the spread from an origin in Egypt about 5000 years ago is about as likely to be right as a thesis that the principal mammalian orders originated at one specified period in one named area under one set of circumstances, and then spread out over the earth with not much more change than the loss of some species, genera, and families and the modification of others. The Kulturkreis theory, or as it is sometimes renamed, the Kulturgeschichtliche Methode, is not quite so simplistic. But the six or eight blocks of culture trait associations which it posits as primary are comparable to six or eight associations of species which might be asserted as having produced all the faunas of the world. If any modern zoologist were to advance such a view, he would at least indicate the approximate time and place and peculiar circumstances of origin of his primary blocks or associations. This the Kulturkreiser have hardly, or only secondarily, begun to do. After all, pointing out that this and that recent culture here or there consists largely of constituents from such and such primary blocks, is not the equivalent of defining the circumstances of the origin of the blocks. Father Schmidt's valiant and brilliant remodeling has done much to deprive the original Graebner scheme of its stark baldness and mechanical rigor. But the value of his modifications lies in themselves, not in rendering the scheme more demonstrated. They would probably be having more influence if they had been made independently of the scheme. And finally, the claim to the names "diffusionist" and "culture-historical" is about as unfortunate as if the adherents to a particular set of palaeontological or systematic interpre-

tations were to proclaim these as "the evolutionistic view." All modern ethnologists recognize diffusion and all deal with culture history.

Anthropology is younger than biology and controls a smaller and less intensively organized and classified body of accurate fact. It is natural therefore that critical standards have generally been less exact; that there has been much formulation of broad, conceptually simple schemes subsequently fortified by selected evidence; that too often the necessity has not been felt for purely empirical procedure and strictly inductive interpretation. The foregoing pages have attempted to show that in spite of the difference between organic and superorganic or cultural phenomena, and the widely diverse mechanisms inherent in them, the historic course of the two sets of phenomena, the problems which they present, and especially the methods by which these problems can be approached and valid solutions given, are strikingly similar at many points.

In anthropology as in biology, interest can center primarily in process or in event—in "physiology" or in "natural history." Many physiologists, having only a weak interest in phenomena, are little impressed even by the soundest, empirically founded, careful reconstructions of events, but are correspondingly sensitive to errors and excesses in such reconstructions. They therefore generically distrust the findings of historical—unfortunately miscalled "evolutionary"—biology, and would restrict natural history to a relatively sterile, static, descriptive "systematics," admitting sequences only so far as they are established by the palaeontological record, which will necessarily always be extremely incomplete.

In the same way in anthropology a preponderant addiction to the so-called "dynamic" or processual aspects can lead to a generic suspicion or dislike of all historical reconstruction, whether critical or fantastic, with ethnography relegated to an essentially descriptive rôle, and only archaeological evidence admitted as historically sound—though even then relatively unimportant because processes can never be traced with the same fullness in excavated as in historic or living cultures.

If "physiology" were the only valid aim of the sciences of life and culture, these attitudes would be justified. But since there are no events without processes, and no processes without events, and neither can be wholly grasped without knowledge of the other, what is actually involved is a different centering or weighting of interest; and this reflects temperament or personality as much as anything else. There are those who prefer to deal directly with phenomena, treating process chiefly as it is inherent or implicit in them. There are others whose bent it is to abstract processes, to render them explicit; and to such minds events have little meaning except as step-

ping stones, or illustrations. Each procedure achieves results peculiar to itself; each supplements the other. Carried to extremes in isolation, the one method would lead to an unorganized phenomenalism; the other, to a barren, arid conceptualism. A healthy and complete science must rest on both approaches, on a reintegration of the two. Fundamental misprizal of either approach is unwarranted. A generation or two ago biology entered upon a phase in which some saw virtue and profit only in the laboratory table and experiment. Natural history was decried as merely factual, as antiquarian and descriptive, as productive of the materials of science but not scientific in itself; as uninterpretative when sound, and subjective when interpretative. But natural history has survived and flourishes. Anthropology, having only lately consciously discovered process in culture, is now showing signs of entering the same phase of development. According to some, culture history is to remain a descriptive prolegomena; culture reconstruction, however undertaken, is felt as a waste of effort or dangerous delusion. Except for biology being farther developed, the situation is much the same: within each discipline, tolerance of both the possible approaches is called for. In anthropology as in biology good science consists primarily not in seeing event through process or process through event, but in tempering imagination with criticism and in ballasting judgment with evidence.

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