The Concept of the 'Ecological Complex': A Critique*

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ABSTRACT. This paper presents certain distinct and fundamental shortcomings contained in ecological explanations that rely upon physical variables. The limitations stem from the continuation of impersonal notions and questionable analytical premises.

I

THE WRITINGS DEALING WITH HUMAN ECOLOGY reflect two schools of thought. There is what we can refer to as the materialistic orientation on the one hand and the voluntaristic approach on the other.

Materialistic writers seek explanation for ecological developments in non-social conditions by arguing that specific forces determine ecological phenomena apart from man's efforts to intervene through the imposition of social choice. In defending their case, materialists implicitly or specifically deny the relevance of social values and/or culture. A schism, however, prevails among materialistic ecologists: one group holds to a biotic interpretation of ecological developments, while another advocates a physical viewpoint. We shall label the biotic position "traditional materialism" and the physical orientation "neoclassical materialism."

The biotic ecological approach of traditional materialists, stemming out of Social Darwinism, generally defines man's distribution over space resulting from biotic competition as the subject matter for human ecology. Traditional materialists then proceed to study biotic competition as a subsocial process through such concepts as dominance, succession, invasion, natural areas, concentric zones, sectors, etc. Sociologists such as Robert Park, Ernest Burgess, Roderick McKenzie, Robert Faris, among others, founded the now passé biotic perspective.[1]

In 1938, the biotic framework came under severe criticism with the publication of Milla Aissa Alihan's critique, *Social Ecology,* and Warner

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[1] Robert E. Park, *Human Communities: The City and Human Ecology* (Glencoe, Ill.: Free Press, 1952); Ernest W. Burgess, *The Urban Community* (Chicago: University of Chicago Press, 1926); R. D. McKenzie, *The Metropolitan Community* (New York: McGraw-Hill, 1933); Robert E. L. Faris, "Ecological Factors in Human Behavior," in J. McV. Hunt (ed.), *Personality and the Behavior Disorder* (New York: Ronald Press Co., 1944), pp. 736–57.

Gettys' significant article.[2] In 1947, two other works questioning traditional materialism appeared: Walter Firey's *Land Use in Central Boston* and an article by A. B. Hollingshead.[3] These writers launched a new perspective for human ecology which we can call the "voluntaristic" approach. Writers voicing the voluntaristic orientation vigorously attack as unrealistic the biological premises of traditional materialism and demand instead that ecologists seek explanation solely in man's social organization. We might also mention the names of William Form, Christen Jonassen and Gideon Sjoberg, who, among others, persist in writing as voluntarists.[4]

However, for purposes of this paper, we shall focus our attention upon the most recent ecological argument, namely, the "neoclassical" materialistic position. We may identify writers of this type by their reliance upon *physical* factors. The neoclassical ecologists, while relinquishing the biotic inclinations of their materialistic predecessors, nonetheless hold to impersonal notions to justify the "neoclassical" label. The most outstanding representatives of neoclassical materialism are Amos Hawley, Otis Duncan, Leo Schnore, Jack Gibbs and Walter Martin.[5]

Neoclassical materialists generally define the responses of man's sustenance and/or social organization[6] to certain "objectified" elements as the domain for ecological investigation; they firmly reject notions of subjectivity. These writers examine what is commonly called the "ecological complex"—consisting of population, social organization, environment and technology.

These four factors, according to neoclassical materialists, are external,

[2] Milla Aissa Alihan, *Social Ecology* (New York: Columbia University Press, 1938); Warner E. Gettys, "Human Ecology and Social Theory," *Social Forces*, 18 (May, 1940), pp. 469–76.

[3] Walter Firey, *Land Use in Central Boston* (Cambridge: Harvard University Press, 1947); A. B. Hollingshead, "A Re-Examination of Ecological Theory," *Sociology and Social Research*, 31 (January–February, 1947), pp. 194–204.

[4] William Form, "The Place of Social Structure in the Determination of Land Use: Some Implications for a Theory of Urban Ecology," *Social Forces*, 32 (May, 1954), pp. 317–23; Christen Jonassen, "Cultural Variables in the Ecology of an Ethnic Group," *American Sociological Review*, 19 (February, 1954), pp. 3–10; Gideon Sjoberg, *The Preindustrial City* (Glencoe, Ill.: Free Press, 1960), Chap. IV.

[5] Amos Hawley, *Human Ecology* (New York: Ronald Press, 1950); Otis Dudley Duncan and Leo Schnore, "Cultural, Behavioral, and Ecological Perspectives in the Study of Social Organization," *American Journal of Sociology*, 65 (September, 1959), pp. 132–49; Leo F. Schnore, "Social Morphology and Human Ecology," *American Journal of Sociology*, 63 (May, 1958), pp. 620–34; Jack P. Gibbs and Walter T. Martin, "Toward a Theoretical System of Human Ecology," *Pacific Sociological Review*, 2 (Spring, 1959), pp. 29–36.

[6] For purposes of our summary and analysis of the writings by neoclassical materialists, we shall equate "sustenance activities" and "social organization."

physical—hence impersonal—conditions that absolutely determine ecological phenomena regardless of cultural or social efforts to interject direction and choice. Man's behavior—irrespective of his culture and social values and his social activities and irrespective of volition—must comply with certain impersonal physical conditions to be ecologically relevant from this materialistic perspective.

II

A METHODOLOGICAL EVALUATION of the neoclassical argument indicates, however, that, like its biotic predecessors, this contemporary attempt to establish the field of human ecology on an impersonal basis simply cannot be sustained. The non-social contentions of neoclassical materialism fail to meet valid standards of performance owing to the several errors arising from the attention ecological materialists give to false analytical premises.

First, materialists resort to tautological reasoning when they lay claim to the ecological complex in formulating a problem for investigation. According to this orientation, ecologists should examine "the precise technological, demographic, and environmental conditions under which various urban forms of organization may be expected to appear."[7] Hawley, Duncan, Schnore, Gibbs and Martin, among others, insist, then, that they seek to investigate the interrelationships between the variables constituting the ecological complex. After positing data relevant only to the ecological complex as "analytically distinguishable elements,"[8] neoclassical materialists then proceed to explain their ecological data by the identical "ecological complex." Thereby they become tautological.

In short, the neoclassical materialist relies upon the ecological complex not only to furnish his data but also to analyze his data. Thus the subject matter and explanation are identical for the neoclassical materialist: population, organization, environment and technology provide the data for analysis in terms of population, organization, environment and technology.[9] Because it remains to be demonstrated that a tautological proposition can be empirically tested, the neoclassical orientation offers little in the way of scientific comprehension.

[7] Duncan and Schnore, *op. cit.*, p. 138.

[8] Otis Dudley Duncan, "Human Ecology and Population Studies," in Philip M. Hauser and Otis Dudley Duncan (eds.), *The Study of Population* (Chicago: University of Chicago Press, 1959), pp. 683–84.

[9] Substantiation for this contention can be found in the many articles in which the neoclassical concept is applied. For example: Leo F. Schnore, "Social Problems in the Underdeveloped Areas: An Ecological View," *Social Problems*, 8 (Winter, 1961), pp. 182–201; Otis Dudley Duncan, "From Social System to Ecosystem," *Sociological Inquiry*, 31 (Spring, 1961), pp. 140–9.

A second error committed by neoclassical materialists results from the mixed order of data that resides in the ecological complex. In this complex, we find the neoclassical materialists indiscriminately blending the non-material element of social organization with the material components of technology, geography and population. While these writers define all ecological variables external to the acting individuals, this cannot provide a rational basis for their insistence that material elements, such as the environment, determine the modes and/or content of social organizations. In no instance do we find an ecological materialist offering a *common* basis for the possibility of *interaction* between physical and social data. In short, where is the level of analysis that includes both orders of data? Stuart Chase, among others, notes the lack of logical premises for this type of neoclassical argument by exclaiming:

> The scientific method demands that when facts are compared, they must be of the same order. Do not add cabbages to electrons and expect to get a total which means anything.[10]

Sorokin's many works reflect his insistence that the two orders cannot be mixed in such a way that analyses "derive the conclusion that the material variable . . . determines the immaterial variable."[11] On the basis of similar reasoning, it can be shown that the neoclassical's "ecosystem"[12] has no empirical referent and hence cannot prevail even on a conceptual level.

A third shortcoming in this position stems from its firm belief that social values are psychological and therefore must be excluded from an ecological inquiry. The justification for this neoclassical statement rests upon the contention that ecologists must assume a collective perspective rather than an individualistic framework supposedly intrinsic to the social-value concept. This logic, however, necessitates the omission of problems that simply cannot be separated by analytical finesse. Furthermore, we shall note that the neoclassical materialist fails to present a collective perspective since he relies upon data that are entirely individualistic. But let us first consider the error of data-omission that results from the attempt by neoclassical ecologists to separate the inseparable.

III

COMPLETE TRUST in external determinants precludes the possibility of

[10] Stuart Chase, *The Proper Study of Mankind* (New York: Harper, 1948), p. 21.
[11] Pitirim A. Sorokin, *Sociocultural Causality, Space, Time* (Durham: Duke University Press, 1943), p. 61.
[12] Duncan, "From Social System to Ecosystem," *op. cit.*

choice. Yet there are many instances of choice situations within the very subjects presented by neoclassical materialists. Duncan, for example, deals with the smog situation in Los Angeles as though a population *automatically* reflects the changing physical setting through a social organization's implementation of technological devices in a *unidirectional* fashion, when in fact serious alternative responses have been and are now being discussed by governmental agencies as well as other social organizations.[13] Disputes involving *populations* with regard to establishing the form and/or content of *social organizations* within Los Angeles for *technological* control of the *environmental* smog are taking place. But Duncan presents his analysis as though a social organization merely mirrors environmental alterations in a rigor mortis fashion.

Schnore continually acknowledges the possibility of choice in dealing with social problems of underdeveloped countries from an ecological perspective—*e.g.*, the on-and-off-again birth-control policy in Communist China, the alternatives of capitalism and Marxism for industrialization, the possibility of choosing the "correct" course of action in contradistinction to "failure."[14] He goes so far as to claim: "The harsh truth is that there are *alternative* forms of government, and the main organizational question facing us is which of the various directions will be taken by the new nations of the world."[15]

Yet such writers do not introduce concepts in their ecological framework to deal with choice situations. Instead, they perceive fixed relationships between the forces composing the ecological complex which operate outside any individual and which dictate the course of ecological developments.[16] Neoclassical materialists insist that the social structure, population, technology and environment *preordain* the course of ecological events. Even in their analyses of social organization they perceive external determinism by relying solely upon what we might call the "normative argument"—the implicit contention that the mere presence of a norm and recognition of it by actors result in conformity to the requirements of the norm. If this proposition be true, rather than social action we have reflex in human behavior; rather than decision-making processes, we have structural edict; rather than actors choosing between alternatives,

[13] *Ibid.*

[14] Schnore, "Social Problems in the Underdeveloped Areas," *op. cit.*

[15] *Ibid.*, p. 191. Emphasis in the original.

[16] The ecological studies by other neoclassical writers also contain this fixation notion. For example: Jack P. Gibbs and Walter T. Martin, "Urbanization and Natural Resources: A Study in Organizational Ecology," *American Sociological Review*, 23 (June, 1958), pp. 266–77.

we have the structure "making" decisions. Social action becomes irrelevant and is, at most, a mere revelation of the social structure rather than the establishment of a social structure.

But the normative argument fails to account for social behavior and an existing social organization because it cannot explain (1) the selection from alternative normative courses of action and (2) conformity or nonconformity to the normative pattern itself.[17] To insist that a social structure chooses from its own alternative structural possibilities and that it is the very nature of a social structure to generate conformity or nonconformity to its own structural features as implied by neoclassical ecologists—all this is only to argue from a tautological perspective of structure determining structure. There can be no empirical testing of this tautological position.

The elimination of the concept of social values by neoclassical materialists inadvertently leaves only a theory that makes both social action and social organization preordained, inevitable and unalterable; man himself is only a passive creature manipulated by forces of change that the neoclassical ecologists define as "external," "physical" conditions; man is simply a physical particle performing in limbo to the dictates of the ecological complex.

The concept of social values is not, as claimed by neoclassical ecologists, a psychological analytical tool; the concept is as sociologically relevant as the notion of social organization. Social values involve the conceptual characteristics of any other sociological construct in that they have references to aspects of social life that are shared, acquired, transmitted from one generation to another as well as from one society to another, etc.

The rejection of the social-value concept, however, has not meant that the neoclassical materialists have rid themselves of individualistic notions in favor of a collective emphasis. The overwhelming preference for employing census material as a basic source for ecological data[18] commits the neoclassical ecologists not to a collective orientation at all, but rather to the notion that the mere summation of discrete units yields the whole. Census data do not form a collective representation; such information is strictly individualistic and is collected from that point of view to contra-

[17] The normative argument is suggested by Emile Durkheim's observation that the very existence of norms infers that social behavior is or could be contrary to normative stipulations.

[18] For example: Hawley, *op. cit.*, Part II; Otis Dudley Duncan, "Population Distribution and Community Structure," *Cold Spring Harbor Symposia on Quantitative Biology*, 22 (1957), pp. 357–71. The strongest statement on this facet of neoclassical materialism has been expressed by Leo Schnore in a paper delivered at the national meetings of the American Sociological Association, St. Louis, September, 1961.

dict the neoclassical collective perspective. Moreover, neoclassical materialists do not fully appreciate the apparent fact that census data represent the collection of characteristics selected according to specific governmental requirements which are not necessarily conducive to proper scientific inquiry.[19] To permit a formal agency the opportunity to gather data according to the needs of a certain organization rather than by the scientist for scientific investigation prevents the intrusion of data which could be relevant for ecology. In short, the ecologist must not come to rely, as do the neoclassical ones, upon others for data that involve obvious non-scientific criteria for collection.

IV

A FINAL ASPECT concerning values includes both traditional and neoclassical ecology. In each perspective we find a rejection of the social-value concept on the ground that explanations must be established in terms of non-social and impersonal forces. By stressing biotic and physical factors that "demand" compliance, ecological materialism offers a positivistic approach which denies the relevance of volition. However, materialism is not value-free simply because there is ample empirical evidence to demonstrate that it merely expresses a particular value system existing within the American culture at the present time. Several studies of zoning activities clearly sustain this contention.[20] The empirical data reveal that the theoretical approach of ecological materialism reflects what has been called the "economic-value orientation"—a social-value perspective voiced by certain decision-makers who contribute to the zoning process.[21] Both materialists and economically oriented decision-makers perceive identical physical conditions as determining the forms of social organization in the adaptation to space.

The competitive process which ecological materialists contend takes place in accordance with efficiency[22] is merely a reflection of the profit-motive orientation of some decision-makers in the zoning process and, more broadly, of many individuals in the American culture. The zoning data

[19] See Henry S. Shryock, Jr.," The Natural History of Standard Metropolitan Areas," *American Journal of Sociology*, 63 (September, 1957), pp. 163–70.

[20] Sidney Willhelm and Gideon Sjoberg, "Economic vs. Protective Values in Urban Land Use Change," *American Journal of Economics and Sociology*, 19 (January, 1960) pp. 151–60; Form, *op. cit.* An extensive discussion of this point is to be found in Sidney M. Willhelm, *Urban Zoning and Land-Use Theory* (New York: Free Press of Glencoe, 1962), Chap. VII.

[21] Willhelm and Sjoberg, *op. cit.*

[22] For example: George Kingsley Zipf, *Human Behavior and the Principle of Least Effort* (Cambridge: Addison-Wesley Press, 1949), p. 350; Robert E. L. Faris, *op. cit.*, p. 373; and Amos Hawley, *op. cit.*, pp. 178 and 215.

show that man's efforts to accommodate to cost[23] simply express a desire on the part of certain individuals to adjust in this manner. The facts of existing land usages and geographical conditions which ecological materialists label "impersonal" forces dictating the distribution of ecological phenomena[24] are essential aspects of the economic-value orientation to be found in the zoning process. And, finally, the notion of "functional organization"[25] in terms of an "ecological complex," espoused by certain ecological materialists, restricts ecological investigation to those very aspects of social life considered to be the *only* relevant data by the persons in the community who advocate the economic-value orientation in the zoning of property.

Consequently, in the light of empirical testing, it is most difficult for materialists to argue a value-free exposition when in fact they voice a prevailing American value system.

A final limiting consideration we shall note in our evaluation of neoclassical materialism is the inability of the orientation to delineate a field of study. That is, the ecological complex simply does not specify the subject matter for the human ecologist in a discriminating fashion. If human ecology is the study of data involved in the ecological complex advanced by the neoclassical proponents, then there is no aspect of modern society that lies beyond the ecological orbit. In other words, there are no sociological phenomena aside from ecological considerations in coping with industrialized societies. What social activity, for example, can take place within the American society that does not involve a population, an environment, an organization and a technology? The ecological complex presents a distinction without a difference.

In sum, the ecological position now so much in vogue cannot persist without basic modification. The tautological reasoning, the physical orientation, the mixed order of data, the indifference toward the social-value concept, the reliance upon individualistic census data in lieu of a collective approach, and a non-delineated subject are outstanding fallacies inherent in the present neoclassical position. An ecological perspective that contains these limitations cannot lead to a fruitful examination of sociological or ecological phenomena.

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[23] Robert Murray Haig, "Toward an Understanding of the Metropolis," *Quarterly Journal of Economics*, 40 (May, 1926), pp. 420–4; Richard U. Ratcliff, "Efficiency and the Location of Urban Activities," in Robert Moore Fisher (ed.), *The Metropolis in Modern Life* (New York: Doubleday, 1955), pp. 125–48; Richard U. Ratcliff, *Real Estate Analysis* (New York: McGraw-Hill, 1961), p. 36.

[24] McKenzie, *op cit.*, p. 247; Hawley, *op. cit.*, p. 385; Duncan and Schnore, *op. cit.*, p. 144; Duncan, "Human Ecology and Population Studies," *op. cit.*, p. 683.

[25] Duncan and Schnore, *op. cit.*, p. 145.