MAN-ENVIRONMENT RELATIONS IN ANTHROPOLOGY:

ON THE FORMULATION OF THE CULTURAL ECOLOGICAL APPROACH

by

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TABLE OF CONTENTS

TABLE

ABSTRACT

This study traces the theoretical development of man-environment relations within anthropology up to the 1950s and 1960s with an emphasis on the United States. It is accordingly a contribution to the history of the development of anthropology.

The logic of the argument is constructed upon and runs along two separate yet partly interrelated themes. Firstly, the current debate on man-environment relations has developed through a succession of positions and counter-positions. Secondly, this movement between what may be seen as extreme positions did not take place within an anthropological vacuum. Quite to the contrary, it has to be understood in relation to both the scientific and societal development at large as well as to other developments within the field of anthropology itself.

The cultural ecological approach is seen as the final synthesis and outcome of these two themes.

PREFACE

This study is based upon a graduate term paper that I prepared at the Department of Anthropology, University of California at Los Angeles (UCLA) in Spring Term 1980, with Professor Allen W. Johnson as advisor. It was recently thoroughly revised and enlarged. The revision benefited greatly from written comments contributed by Professor Johnson, and I am grateful to him for this.

I would also like to acknowledge my debt to Professor Lorenz G. Löffler at the Department of Social Anthropology, University of Zürich for his support throughout.

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> The relations of science and society are fully reciprocal. Just as transformations are produced inside science by social events, so, ... have social transformations been brought about through the effects of science.
> Bernal (1968:1233)

1 BACKGROUND AND INTRODUCTION

The differentiation and establishment of a new sub-discipline in the social sciences can ultimately be traced back to already existing ideas and orientations. Changing relations between culture and environment, as well as changes within a culture, give rise to new ways of looking at and conceptualizing the old truths. In the case of an ecological perspective in anthropological analyses, Netting concludes:

> This perspective did not arise from conscious adherence to a new theoretical framework or the testing of a defined set of hypotheses. It grew rather from a persistent dissatisfaction with formulations of cultural values and types that were felt to be vague and unprovable, as well as with structuralist interpretations that appeared too rigid to accommodate social change and individual variation. (1977:6)

He continues that "The excitement was not that of overthrowing old ideas, but of putting them in a more inclusive context" (1977:6).

While it is relatively easy to outline the components of the larger context Netting speaks about, a deeper tracing of the interrelations between its parts, in short writing the history of the use of an ecological perspective in anthropology, may seem to be premature. At any rate Netting thought so. Dealing specifically with cultural ecology, a term that gradually came to cover much of the ecological orientation in anthropology, he asserts that "There is only one way to explain what cultural ecology is: to show what it is doing" (Netting 1977:6).[1/] While the position Netting is taking here certainly makes sense, this study is nonetheless conceived as a modest contribution to that end. No short and clear-cut definition of what cultural ecology is will be offered. Instead, by trying to trace some of the lines along which cultural ecology has developed, the hope is to be able to show indirectly "what it is".[2/]

The concepts "man" and "environment" as used in this study are to be understood in a broad general sense. The first concept includes human beings and their culture. The function of culture in relation to the environment, specifically as regards the concept of "adaptation", will be dealt with more or less explicitly throughout the study. The second concept, i.e., environment, is to be

understood as both physical, natural environment; as well as socio-cultural, man-made environment. More specifically, the human environment is, firstly, increasingly a product of human interposition and tinkering, and, secondly, a result of an ongoing adaptation to other cultural systems.[3/]

There have been several attempts to structure and organize the area of man-environment relations in anthropology over roughly the last hundred years. In a representative selection of these efforts, briefly summarized in the following, the subject matter has been organized temporally according to distinctive influences in each epoch recognized.

The scheme employed by Bargatzky (1986) features the following "schulen und denkweisen": Umweltdeterminismus, Possibilismus, Cultural ecology, Kulturmaterialismus, Kultureller Adaptationismus, Neofunktionalismus, and "Individuumvorteil-Ansatz".

Bennett (1976) utilizes a framework for discussing the main points in cultural ecology under the following headings: Deterministic anthropogeography, Possibilism, Stewardian cultural ecology, Cultural ecosystemicism, and Adaptive dynamics.

Earl (1980) differs between three schools in the history of human adaptation: Environmental determinism, Environmental possibilism, and Functionalism. Cultural ecology is seen as an extension of functionalism to include the relations between human populations and their environment.

Ellen (1982) recognizes the following models: Determinism, Possibilism, Cultural ecology, Ideas derived from modern biology, Energetics, and Systems theory.

According to Hardesty (1977), there are three traditions of environmental explanation: Environmental determinism, Possibilism, and Ecology.

For Netting (1977), cultural ecology is a logical extension of certain tendencies in anthropology. He distinguishes three major trends or approaches in anthropology after 1900, namely the Ideological, the Social structural, and the Ecological approach.

The layout of the scheme adopted by Voget (1975) is somewhat difficult to discern. After briefly mentioning possibilism, he proceeds to discuss what he calls Steward's "ecosociology". From there on the discussion to some degree at least seems to be organized around concepts derived from biological ecology.

Before proceeding, a word of caution is in its place. The above mentioned frameworks are not necessarily comparable. Apart from the obvious distinction in point of view, differences between them may be due to the fact that they are constructed and aimed at partly different purposes or cover different time periods.

In this study, the argument will proceed through three stages termed Determinism, Possibilism, and Cultural ecology. This would seem to represent a common denominator of the above schemes. In addition, important aspects of evolutionary approaches and economic anthropology as they relate to man-environment relations will be reviewed under separate headings.

For reasons to be spelt out below, this contribution to the history of the development of an ecological perspective in anthropology will primarily focus on the developments in the United States. This is admittedly a limited perspective both geographically and academically speaking. Such a limited perspective can however be defended on the grounds that the early focus on ecological issues in American anthropology is basic to understanding the later developments, e.g., in European anthropology.

Based on the initial formulation by Steward (1937) of the content and aim of cultural ecology, there have been very interesting and diverse developments in cultural ecology. This study will however be limited to a discussion of the various lines of thought that came together and was synthesized in Steward’s concept “cultural ecology” in the 1950s and 1960s. The adopted scheme is fairly simple, straightforward, and crude in its conception. This is to a large extent caused by the fact that the discussion has been organized around the contribution of specific persons. The persons discussed have figured more or less importantly in the formulation of the cultural ecological approach, both directly and indirectly. Because of this, the analysis may not have been able to attain the necessary high level of abstraction and generality in its conclusion.

Another reason why the scheme is lacking in analytical clarity and understanding, is because of the more or less implied ideas of clear-cut divisions between the different stages that are recognized, and the seemingly orderly way in which they follow each other. It is necessary to make it clear that this to a large extent is a heuristic device. There are overlapping between the stages and causal connections between them, and they do not necessarily follow this orderly scheme.

Sciences, including anthropology, develop partly through a process of reciprocal influences and a consequent continual redefinition of the borders between them. This will be given a limited coverage in this study, primarily through tracing some of the relations between anthropology, on the one hand, and archaeology and economics, on the other hand. Sociobiology and other biologically oriented sub-disciplines as they relate to the development of cultural ecology will not be discussed.

Personal data and other information are included to the extent that it facilitates an understanding of an authors' contribution and position. Further biographical data are included in the Appendix. The various contributions should be seen in relation to their time of

publication. This is because an author’s position on a particular topic may have been subject to modifications and development over the years. Where applicable, data on the first publication of a cited work are supplied in the References.

2 DETERMINISM

Historically and philosophically speaking, the roots of Western notions of the interrelations between man and environment are very old. What it all amounts to, is what has been labelled a "superorganic" conception of culture.[4/] This involves an implicit emphasis on human beings and their culture as independent of Nature. As a consequence of this perceived dichotomy, explanations of human diversity or unity were to be found either in intra-human or external conditions. In the first case the position was one of biological or psychobiological determinism. In the latter case the milieu or surroundings was seen as the causal factor. The most wide-spread of the doctrines based on milieu were the climatic and geographical. Among the proponents of these theories were Aristotle, Hippokrates, Huntington, Montesquieu, Plato and Ratzel (Bennett 1976; Hardesty 1977; Voget 1975).

Some of the scholars classified here as “determinists”, can also be seen as representing the older and partly naïve evolutionist and diffusionist positions. This goes, e.g., for Ratzel and his “anthropogeography”, as well as for Adolf Bastian and his emphasis on “parallelism” in human societal development.

At this point it is only correct and fair to point out that the possibilists' characterization of the so-called "naive linear deterministic view" is at best an oversimplification (cf. Kaplan and Manners 1972:38-43; Service 1968:223). In point of fact it may never have actually existed. As will be argued later on, this argument to some extent at least has to be understood as masking a primary concern with a conflict over political values.

All in all, the crude deterministic argument was however rather naïve. It was clear that it sooner or later would have to be challenged.

3 POSSIBILISM

3.1 Background

The general orientation of explanations of man-environment interrelations in the United States shifted towards what came to be called "possibilism" in the late 1920s and the 1930s.

There was in possibilism a reaction against the one-sidedness of environmental determinism. This shift is connected with the emphasis that was put on Nature relative to Culture in explaining their interrelation. The change was a gradual one, and to the extent that it is possible and feasible to date it, it is more a question of personal preference than of anything else. Accordingly, although Clark Wissler did not belong to the circle around Franz Boas historically, he will be discussed in this context.

In establishing the historical method in American anthropology and attacking what he saw as evolutionary fallacies, Boas figured as a central person in the emergence of American cultural anthropology. Central to this position was his emphasis on the basic differential and divergent character of cultural development, while allowing some room for contact and diffusion. This conception came to be termed “historic particularism”, and it has been seen by some as a separate school of thought. Furthermore, the emphasis on particularism should be seen as Boas’s alternative to evolutionists’ emphasis on parallelism. In this way American anthropology due to an emphasis on culture process as historic interchange or interaction, departed from European, i.e., mostly British anthropologists, due to their structural-functional emphasis on social interaction.[5/]

Just as fervent as Boas fought the evolutionists, did he fight the different diffusionist positions. These two positions differ in that while evolutionists focused on determining the various stages of cultural development, diffusionists concentrated on searching for the basic and original cultural configuration that is the key to the present multitude of cultural traits.[6/] He was himself to some extent influenced by the German-Austrian “Kulturkreis” theorists. But he opposed their view that disparate cultural elements could be assembled into cultural complexes and treated as if they diffused as a unit. However, due to certain limitations of Boas' perspective and his historical method, a reintroduction of an evolutionary orientation by V. Gordon Childe and Lesley A. White was unavoidable. Likewise the historical method did not prove helpful in attacking the appearance of worldwide diffusionist histories.

Boas was instrumental in the growing criticism against determinism and the new orientation that was to replace it. He emphasized specific cultural explanations (cf. the label of "historic particularism"). According to Boas, environment played an important role in explaining why some features of culture did not occur, but not in explaining why they did occur. In other words: environment limits, but does not cause human behaviour or culture. This possibilistic position was developed to its logical conclusion by Boas' student Alfred L. Kroeber. However, before turning to Kroeber it is necessary to discuss Wissler. To a large extent they both developed the same theoretical and methodological framework. The argument put

forward by Kroeber is moreover to some extent directed against Wissler and corrects him.

3.2 Clark Wissler

Wissler and Boas were associates at the American Museum of Natural History. Here, following Boas' lead, he started arranging exhibits by region and tribe rather than by type. This museological invention Wissler is generally regarded as having developed into what is now known as the "culture-area" concept (Ehrich and Henderson 1968). His interest in man-environment relations developed by way of this concept with reference to North American Indians (1926, 1938). A starting point for his analysis was the close correlation he noted between maps showing archaeological areas and the generally recognized culture areas of the historic tribes, respectively. He defined six "food-areas", and proceeded to define and describe ten culture areas (1938). He furthermore indicated the distribution of certain traits and their regional adaptation.

In a later publication (1926), he developed his argument on diffusion and adaptation further and put forward two hypotheses. The first is concerned with the way in which traits spread. The second hypothesis uses the so-called "age-area" concept in order to make inferences regarding the relative age of traits (cf. Wallis 1968:560).[7/]

In assessing Wissler's contribution, it is important, first, to note that it is largely descriptive. He never made more detailed analyses of the correspondence between culture areas and environmental areas. Furthermore, his use of historical insights is almost negligible. To quote one reviewer, "The culture-area classification remains a nearly static one, and apart" (Kroeber 1963:4).

Wissler (1938) concludes that environment does not produce a culture, it stabilizes it. The delineation of the six food-areas and the ten culture areas in North America is largely based on common usage. Although Wissler is not very clear on the relationship between them, it seems that the culture area classification really is based on the food-area classification.[8/]

Regarding to the age-area concept and the hypothesis about regional centres, Wissler can be criticized for not recording any exceptions to the pattern he outlined. He also never explained why diffusion could not have taken place from the periphery to the centre (Wallis 1969).

Woods emphasizes how Wissler in the beginning emphasized material culture, but later "... expanded the culture content of his areas [so] as to give the impression that culture areas were regions with relative uniformity of total culture" (1934:518). Wissler's criteria for delineating culture areas are not always very sound. Some tribes, e.g., the so-called "marginal tribes", are very difficult to place. Since the marginal tribes in

some cases seem to occupy the greater part of a specific culture area, it may seem that Wissler is more concerned with culture centres than with culture areas.

In summary, Wissler's static and descriptive view of man-environment relations, his lack of historic perspective, and the easiness with which he generalizes, makes for a not very convincing statement on the relation between man and environment. To the extent that his model is coherent and any definite conclusions can be drawn from it, and although it is situated well within the possibilist tradition, one has to conclude that it leans more toward a deterministic position.

Although theoretically outdated, he is still considered important for the way in which he bridged the Boas period with what came to follow. More specifically, he is generally regarded as having formulated the concept of culture-area. He popularized it widely, and it became connected with the school of historic particularism. Used cautiously it can serve in comparative analyses, and it can also aid in the study of culture history, cultural dynamics, and cultural processes. In this way Wissler antedated later important work within the man-environment paradigm to be spelled out in more detail below (cf. Herskovits 1930; Kroeber 1963; Steward 1955).

3.3 Alfred L. Kroeber

Kroeber's point of departure is as follows:

> ... space and time factors are sufficiently inter-related in culture history to make the culture a valuable mechanism, rather than a distraction, in the penetration of the time perspective of the growth of cultures so relatively undocumented as are those of native America. (1963:2)

In his treatment of cultural and environmental classifications of North America, he relied heavily on the concept of culture area and developed it further. The culture, or cultural wholes, was the central unit, and he was opposed to the ideas that cultural traits were central. At the same time he clearly saw the danger of the extreme reaction against environmental determinism, and he emphasized the importance of focusing more on environmental factors in anthropology. In following this program, Kroeber went about and provided a thorough and professional treatment of environmental classifications of North America. Based on detailed data on a number of variables concerning the natural environment, he managed to define, describe, and analyze several new and significant relations between ecology and type of social organization. In this way he was able to draw more specific conclusions on concrete man-environmental correlations than previously had been done. Kroeber's chief finding was that natural phenomena and cultural patterns coincided only when historical conditions permitted. In accordance with the importance he gave

culture relative to environment, his statement that "The immediate causes of cultural phenomena are other cultural phenomena" (1963:1), makes sense.

Kroeber's position within the orientation of historic particularism made him view earlier analyses of the correspondence between culture areas and environmental areas critically. They were mostly descriptive and synchronic, and were not very occupied with time factors in the evolution of cultures, e.g., as witnessed in the case of Wissler. For Kroeber however, this is all very important. Cultural processes had to be explained diachronically, events and processes are mutually interdependent. According to this, time becomes a factor in all events. In his explanation of cultural processes, Kroeber was furthermore influenced by the prevalent views on diffusion. He was however careful in pointing out that although diffusion was important, one had to look at each case separately. He thus acknowledged that the occurrence of cultural elements might be attributed to independent invention, e.g., as in the case of the “couvade”. He insisted that culture areas lack absolute boundaries, and that culture centres not necessarily were the centres of origin and dispersal. The opposite process, a "drawing in" of culture elements (cf. Beals 1968:459), could also take place.

Kroeber's importance in the context of this study hinges on two important aspects of his theoretical apparatus. Firstly, and as a consequence of the primary focus on culture, his argument on the pre-eminence of humans versus the environment was given its most coherent statement through the concept of the superorganic (Kroeber 1917). This to some extent antedated the later emphasis on 'progress' to be discussed below (cf., e.g., White 1959). Secondly, there is his emphasis on the nature of culture and cultural processes, as evidenced especially in his focus on culture areas and cultural units. His most systematic theoretical contribution was in this area, and he seems to have paid relatively little attention to social organization, technology and ecological adaptation. He followed up earlier theoretical developments, e.g., by Wissler, and took them further. This is most clearly seen in the concept of culture area that became very central in Kroeber's version of possibilism. The chief limitation of his conceptual apparatus was the use of an undifferentiated concept of culture. It seems that Kroeber was preoccupied with generalization and correlation on the level of cultural wholes (cf. Bennett 1976). This insistence inevitably led to a situation where there were a lot of cases for which no correlation could be found, and these Kroeber excluded. He seemed to prefer generalizations on the grand level, a pursuit which was mostly in vain. These efforts made him not see the value of empirical generalization concerning the relation between important parts of culture and environment. This deadlock was only resolved by Steward, specifically through his multi-linear evolution.

Following a brief discussion of Forde, the contribution of Kroeber and the possibilist tradition as such to an understanding of man-environment relations will be examined.

3.4 C. Daryll Forde

Forde worked in California in the late 1920s under Kroeber and Robert H. Lowie. Here he became influenced by American culture historicism, and later on by Childe. Although he did not belong to the Boas school historically, his view of man-environment relations justifies treating him as a possibilist in this context.

Forde's version of possibilism included among other things a heavy reliance on diffusion:

> That the culture itself is not static, that it is adaptable and modifiable in relation to physical conditions, must not be allowed to obscure the fact that adaptation proceeds by discoveries and inventions which are themselves in no sense inevitable and which are, in any individual community, nearly all of them acquisitions or impositions from without. (1963:463)

Forde formulated his adherence to the possibilist doctrine in the following way: "... physical conditions have both restrictive and permissive relations to human activities" (1963:463). He furthermore shared Kroeber's view on the importance of history for an understanding of man-environment relations and cultural evolution in general. He acknowledged the basic importance of the concept of culture area as used by Kroeber, but had a fundamental critical attitude regarding some implications of its use:

> [The culture area's] abstract character must be realized. It cannot replace the reality of cultural variation in time and space, and must not be allowed to obscure the individuality of particular societies. (1963:467)

In a few but important places in his argument, Forde seems to take a different position than Kroeber. This concerns first the importance of culture relative to environment, and secondly the possibilities for generalization. On the relative importance of culture and nature, Forde says:

> To approach the study of human society from an exclusively internal point of view may result in a very serious failure to appreciate the strength of cultural inertia. The belief that functional relations owe their existence to the needs they now fulfil, when they may be secondary by-products; the assumption that of two related elements neither could exist apart; in brief, the ascription of genetical significance to the existing functions of cultural traits and the

> neglect of any attempts to trace their history, can lead to a sociological determinism as invalid as environmentalism. (1963:471-72)

He is also clear on the possibility of generalization on the basis of cultural wholes as the important analytical units:

> It is not possible to classify the specialized economies of the food-gatherers according to broad climatic and vegetation regions, for it is not the general but the special character of the particular environment that is important. (1963:373)

He stresses the wide variety within the traditional ways of delineating adaptations to the environment: "Peoples do not live at economic stages. They possess economies; and again we do not find single and exclusive economies but combinations of them" (1963:461). This wide variation makes it difficult to locate broad generalizations about the relation between man and environment, as well as specifying the evolutionary course of mankind. In this way Forde turned out to be not as dogmatic as Kroeber.

In spite of this however, Forde is well within the mainstream of possibilism. An assessment of its contribution the development of the cultural ecological approach follows.

3.5 Possibilism: An assessment

An overall assessment of possibilism can conveniently be done, firstly, with reference to prevalent ideas that it reacted strongly against, i.e., environmental determinism; and, secondly, with reference to the time and socio-cultural setting in which it took place, i.e., the United States in the late 1920s and the 1930s.

Boas, his school of historic particularism and its followers, reacted strongly against the linear causal model of environmental determinism. Here the physical environment was seen as the primary causal agent. In view of the possibilists, this one-sidedness had to be corrected, and they did so by putting more emphasis on culture. This new emphasis appeared as a strong human or "culture"-centred orientation, with the result turning out to be what Bennett characterizes as "... little more than a litany for cultural relativism in the environment context" (1976:162). In other words, possibilism did not turn out to be fundamentally different from environmental determinism. Both employ a linear causal model, with the difference that possibilism substituted the physical environment for culture as causal factor.

The obsession in possibilism with cultural wholes and generalizations on the basis of them missed the important point of a temporal perspective on the development of various types of resource use among different cultures. At the same time this led to underestimating the importance

of the individual actor and the choices she or he makes. This amounts to a lack of understanding cultural processes, as well as to generalize about them.

Reference has earlier been made to Netting's three-tiered scheme (see p. 6). The first of his approaches, the Ideological, is associated with Boas and his students. Netting's critique of this approach echoes Bennett's, since it emphasized

> ... group unity over individual differences, norms specifying what should be rather than observations of what is, and what people thought about instead of how they got a livelihood. (1977:5)

To return a moment to the possibilist concept of culture and its relation to human individual action and choice-making, it may be argued that possibilism did allow room for individuals making choices. However, to the extent that this is true, the explanation is probably that in the possibilist world view of discreet, homogenous cultures, one individual was like another because he was exposed to the same norms. Socialized in the same way they tended to make the same choices again and again.

Steward had questioned the concept of culture-area on methodological grounds. In a discussion of taxonomy and its heuristic role in anthropology, he states that the culture-area concept has become so important as a tool that it has become almost an end in itself. According to Steward,

> [The culture-area concept] has led to the assumption ... that cultural 'facts' have an existence independent of problem and that it is therefore possible to write an 'ideal' ethnology which records all cultural data for the permanent record. (1955:79)

Steward does not deny that the culture-area concept was important in the development of cultural ecology. But he sees a need for going a step beyond the crude descriptive classificatory schemes offered by way of this concept. The logical conclusion of this strong reliance on the culture-area concept was accordingly that it became somewhat deterministic.

The second question to be answered is the reasons, or at least some or them, for the occurrence of possibilist ideas in the context of the socio-cultural, economical, and political setting prevalent in the United States at the time. The truth of the matter is that it is difficult to find out exactly whom, e.g., Forde and Kroeber argued against. One could hypothesize a group of geographers arguing in favour of environmental determinism, and Forde and Kroeber attacking them. This may be at least partly true, but there is all the time the feeling that they are aiming at something else and deeper. Johnson (1980) pictures them as liberal intellectuals that have moulded their message in a framework that suits the mood of the time. According to Johnson, they can be seen as attacking

communism and Marxism. Behind the apparent argument between possibilism and determinism there is, accordingly, another argument between idealism and materialism. The latter position was soon to figure prominently in the development of cultural ecology.

Underlying the whole possibilist preoccupation with cultural wholes and the insistence on the importance of culture, there is at the same time a strong implicit and explicit criticism of nineteenth century postures that still prevailed. The more careful view on, e.g., diffusion is proof of this. Possibilism tried to refute evolutionism completely without coming up with an alternative. Possibilists therefore secluded themselves from the growing concern with evolutionary questions. On the one side there accordingly was a possibilist/diffusionist debate utilizing synchronic data and arguing in terms of structure, while on the other side there was the growing concern with human cultural evolution utilizing synchronic data interrelated in a process. The first debate is mainly concerned with establishing the initial relationship between man and environment, whereas the other deals with processes of change and development in the relation between them.

The above has laid the groundwork for a discussion of the importance of new ideas on human cultural evolution for an understanding of man-environment relations in anthropology. Following another detour for a discussion of the import of thoughts from the growing field of economic anthropology, the reaction to possibilism will be outlined and analyzed.

4 EVOLUTIONARY APPROACHES AND MAN-ENVIRONMENT RELATIONS

4.1 Background

Evolutionary approaches have been around for a long time. They imply a continuous development that is distinguished by the fact that each stage originates in and builds upon the previous stage. This process goes together with the unfolding of forces implied to be potentially present. Evolution was originally connected with physical anthropology. It has however had an impact on cultural anthropology, where it is applied to development of cultural institutions from simple to more complex. The prevalence of these thoughts, and their acceptance among the scientific community, is intimately connected to some very old ideas about the relation between man and environment.[9/]

Most importantly there was the concept of the super-organic. The basic formulation of this concept is given by Kroeber (1917). It implied that a strong and primary importance was placed on the culture of Homo Sapiens. Man's culture was viewed as existing on a superorganic

level, i.e., it was above the organic; which in its turn was above the inorganic level. This view on man and his culture as something unique and above everything else, in its turn led to a belief about human independence from Nature. The idea of a dichotomy between Culture and Nature established itself. This is important, because it led to a deterministic view of the relation between man and environment. A search for reasons for the differences among human races gave rise to either biological or environmental determinism.

Connected with this was a gradual conversion of evolution into unilinear progress or development. Lewis H. Morgan and Edward B. Tylor, but also Herbert Spencer, was responsible for this. They drew analogies between biological evolution and cultural evolution. As in biological evolution, they assumed that cultural evolution was essentially divergent, with instances of parallel evolutionary processes being relatively uncommon. However, as Steward (1955:11-19) argues, the nature of the evolutionary processes in culture and biology are very different (cf. p. 30).

Moving on to the relation between evolutionary ideas, including unilinear evolution and possibilism, there is nothing really new. The shift in emphasis from environment to culture fitted well with the still prevalent view inherent in the idea of the superorganic, and to some extent merely produced another type of determinism, namely what could be called “cultural determinism” (cf., e.g., White 1959). According to Kroeber (1917), man is characterized by his uniqueness and dominance over the natural world. He very strongly criticized nineteenth-century unilinear evolution because no emphasis was given to diffusion. Where unilinear evolution hypothesized many independent origins of similar traits, Kroeber alternatively constructed a scheme where diffusion and migration played an important role in spreading cultural traits that originated a few places. Driver comments upon this argument by stating that the "... age-area hypothesis demands a sequential arrangement of the material, and when this shows a temporal progression in complexity, it becomes evolutionary" (1968:180). Summing up the discussion on possibilism and cultural evolution, the relation between them is very clear in that environment places heavy limitations on the degree or level of cultural development.

In order to understand the later developments in cultural evolutionary thought and its impact on anthropology, the following discussion of the meaning of the concept of evolution, and the relation between evolution and adaptation, will be instructive. It is adapted from Johnson (1979).

Following among others Service (1971), Johnson discusses evolution by reference to (a) sequential and (b) directional advance in terms of some measurable criteria of progress. The sequential aspect of evolution refers to a long term series of observed changes that follow in a

certain order. Evolution is gradual and continuous as opposed to chaotic or cataclysmic. So far, the only reliable evidence for sequential cultural evolution comes from archaeology. There is much evidence for this orderly progression, and the general model is accepted. Childe (1942, 1951a) made a significant contribution to understanding the sequential aspect of cultural evolution. However, ranking living cultures in the same sequence is another matter altogether, and have to be qualified. Our rationale for doing this is that there are patterns in the distribution of living societies that are similar to patterns found in the archaeological record. Johnson (1979) states that it is "... the functional relations among technology, population density, [and] sociopolitical organization that make prediction possible".

Turning now to the second aspect of evolution, the idea of directionality is important because it provides the criteria for classifying separate societies into general stages of the evolution of culture. The basis for the directional aspect of evolution is to be found in popular and vague notions concerning development from, e.g., small to large societies, from informal to formal political institutions, and from simple to complex organizations. This has long been a major weak link in culture-evolutionary theory because it has been connected to "progress". The problem with the direction of evolution is that it ultimately is a product of each individual's own values. The direction of evolution is conceived by evolutionists in terms of, e.g., "efficiency", "order", "productivity", and "reason". The progress is seen as moving towards an end point that is either our own culture or one believed to arrive. Progress in this sense is ethnocentric because it conforms to Western values. In passing, it is interesting to note that these assumptions were directly in contradiction to the Darwinian theory which did not assume the existence of any progression in evolutionary change. The more balanced and sensible course would seem to be to look for measurable criteria of cultural evolution, e.g., population density, community size, regional integration, social structure, centralization, etc., and afterwards decide whether the outcome is "progress".

Johnson (1979) defines adaptation as "'comfortable' adjustment to [the] environment" on an individual level, including aggregates of individuals. Evolution and adaptation accordingly refer to different aspects of the same problem, they constitute two somewhat separate traditions within an ecological perspective (cf. also Service 1971). (Evolution and adaptation are compared in Table 1).

Table 1: A comparison between aspects of evolution and adaptation

Evolution	Adaptation
- General evolution	- Specific evolution
- Unilinear or universal	- Multilinear
- Archaeology	- Anthropology
- Concerned with general development over long time periods (cross-cultural comparisons)	- Concerned with observable adaptations by local populations to specific environments (single comparisons/ ethnographies)

Sources: Adapted from Johnson (1979); Kaplan and Manners (1972:48-59); and Service (1968:226, 1971).

In the following Childe and White, two of the main theoreticians responsible for the later developments of evolutionary positions, will be presented and discussed. Their contribution will to a large extent be assessed jointly at the end of this chapter.

4.2 V. Gordon Childe

Childe was trained as an archaeologist, but in his emphasis on culture-historical processes he explicitly identified himself as an anthropologist. He has given an important contribution in establishing the material evolution of culture in southwest Asia and Europe (1942, 1951a). In doing this he substituted the older approach of illustrating the course of material evolution with tools and the materials used for making them, with an emphasis on the "... use of natural resources for subsistence purposes, and the way these adaptive postures evolved one from another" (Bennett 1976:125).

Utilizing data from Europe and Oriental civilizations, Childe (1942, 1951a, 1958) concentrated his documentation and analysis on the Neolithic and the Bronze Age. He characterized these periods as "the food-producing revolution" and "the urban revolution", respectively. He saw the Neolithic as evolving into a contradiction that was only resolved when agriculture was intensified and started producing a surplus, and the notion of surplus became central to the civilizing process he described. The critical advance leading to the urban revolution was the invention and development of a metallurgical technology. Childe argued that the development of metallurgy was intimately connected with the availability of surplus. He furthermore argued that the concentration of surplus was responsible for the stratification of class society (cf. Treistman 1968).[10/]

Childe tries to define an objective way of looking at progress in human evolutionary history, i.e., the direction of evolution (cf. Treistman 1968). As a general idea, he understood progress as associated with the emergence of civilization, and he measured it as biological survival in terms of increasing population size and density (1951a, 1958). The various recognized "stages" in human cultures were seen as organized chronologically in terms of progress (1958). The more specific, although still loose, definition of progress employed here, seems to be as criteria of technological efficiency in extracting and distributing the means of subsistence. Concerning the causal factor behind cultural evolution, Childe referred to technology as a so-called "prime mover". This must be seen in relation to the emphasis he puts on surplus.[11/] It would seem from this that Childe's view of the direction of cultural evolution is too vague and apparently inherently contradictory. He seems to mix the direction and cause of cultural evolution. Technology cannot at the same time be both an objective measure of the direction of cultural evolution, and part of a causal mechanism. One reason for this contradictory position may be found in the fact that Childe viewed technology as an integrative part of the socio-cultural system, e.g., as in his emphasis on metallurgy (cf. Treistman 1968).[12/]

In his early scholarship Childe had clearly identified a general evolutionary progression in human economic and social life, and in doing this he argued for a less universalistic evolutionism. In later work (e.g., 1951b), he repeatedly focused on human cultural evolution, and the declared aim was to discover the regularities of cultural evolution. He made it clear that "... 'evolution' does not purport to describe the mechanism of cultural change. It is not an account of why cultures change ... but of how they change" (1951b:14). In recognizing the importance of the regional and local variations in cultural evolution, he repeatedly argued in favour of diffusion and assimilation. This led him to emphasize convergence and differentiation occurring as societies adapt cultural complexes to the requirements of differing environments. In this way he avoided simple parallelism in evolutionary development, and alternatively emphasized cultural divergence and convergence. In doing this, he came close to the position taken by Steward on these issues in his cultural ecological approach. In spite of all his good intentions however, this volume to a large extent came across as an evolutionist argument. Chief reasons for this were his preoccupation with progress, and the belief that organisms are intrinsically bound to improve themselves, and these are key elements in the evolutionist tradition.

Childe’s theoretical positions and his interest in evolution led to his characterization as a unilinear evolutionist. Steward (1952, 1953, 1955) was perhaps the most ardent in arguing this view. It now appears that this was a superficial and not well founded proposition since it did not consider Childe’s deep commitment to Marxism

and historical materialism. It is worthwhile at this point to emphasize that Childe was no orthodox Marxist, and he accordingly held no á priori views on the course of societal development. To be fair, this commitment on Childe's part does not come across clearly in his work in the late 1940s and early 1950s as well as in some earlier books. The reasons for this are intimately connected with the socio-political climate of the time (Peace 1988). This was the time of the Cold War and the McCarthy era in the United States, and it is evident that Childe in order to get his ideas across tried to soften his Marxist beliefs. The apparent contradiction between his use of Marxism in his authorship then dissolves.

This leads to a discussion of Childe's impact on anthropology in the United States. Although he only visited briefly on three separate occasions in the late 1930s, he proved throughout his career to be abreast of the developments in the American anthropology. This was made possible partly through his long-lasting correspondence with a host of American anthropologists (cf. Peace 1988). Moreover, the several books he published on archaeology reinterpreting Old World history in light of Marxism were widely read. This influence especially goes for the post-war period at Colombia University and the University of Chicago (Peace 1988). Here, a new generation of students was determined to oppose the long years of Boasian particularism and to bring Marxism back into anthropology. To them, Childe's new and refreshing interpretation of history and human societal development provided and impetus and focus, and he was received with enthusiasm.

The above argument focuses on his more indirect impact on American anthropology. For a more direct involvement consider his focus on the fertile interrelations between archaeology and anthropology (Childe 1946). Here he argues strongly for the two discip0lines as complementary, and points out the importance of the comparative method used on prehistory as well as existent societies as a means towards reaching general laws of cultural evolution.

Behind the interest that Childe generated in cultural evolution, as well as his extraordinary efforts and results in synthesizing the material available to him, lies the fact that archaeology is in a special position to unite historic and evolutionary processes. History suggested to Childe the possibility that "... cultural developments in different urbanized areas moved through structured stages in sensitive response to internal and external conditions" (Voget 1975:-552). Childe's emphasis on the importance of history influenced Steward.

4.3 Lesley A. White

Originally a psychologist, White gradually turned to anthropology by means of other fields, including sociology.

In the late 1920s White got a strong interest in Lewis H. Morgan's work, and this awakened in him an interest in cultural evolution. His first publication on cultural evolution in the early 1940s is viewed as initiating the renewed interest in cultural evolutionism in the United States. Because of this interest as well as other theoretical positions White developed, he was almost considered a heretic by the whole profession. This caused him to adopt an overt polemical attitude especially towards Boas and his school. Considering his theoretical development as well as his lonely position within the anthropological community, it may be pertinent to note his somewhat late coming-of-age as an anthropologist in a period when anthropology in the United States was more or less wholly Boas-dominated.

The concept of culture was important for White. In developing it he focused on man's symboling behaviour and contrasted this with other animals. Following from this, he saw culture as man's extra-somatic means of adaptation, as a mechanism employed in the process of living (cf. Kaplan and Manners 1972:44-45). He thus states:

> A culture, or socio-cultural system, is a material, and therefore a thermodynamic, system. Culture is an organization of things in motion, a process of energy transformations. ... "Culture" is but the name of the form in which the life forces of a man as a human being find expression. It is an organization of energy transformations that is dependent upon symboling. (1959:38)

From the fundamental function of culture, White arrives at an understanding of the evolution of culture:

> Since the fundamental process of man as an organism is the capture and utilization of free energy, it follows that this must be the basic function of culture also: the harnessing of energy and putting it to work in the service of man. And since culture, as an extra-somatic tradition, may be treated logically as a distinct and autonomous system, we may interpret the evolution of culture in terms of the same principles of thermodynamics that are applicable to biological systems. (1959:39)

White's concept of culture is used in two different ways. First he observes that human means of energy release and transformation are more efficient than those used by other species, and nobody disagrees with that. However, the other implication of his culture concept is that the basic function of culture is to extract energy for human purposes. This view is both reductionistic and anthropocentric. In Bennett's words, what White does here

is "... taking a heuristic mental construct (culture) and defining it as substantive reality with its own laws of operation ..." (1976:48). White's underlying value-orientations derived from an adherence to Kroeber's concept of the superorganic (cf. p. 19). The impact of White's science of culture (or "culturology") was therefore to fill the void created by the devastating critique of evolutionary theory by Boas and his followers. In reintroducing an evolutionary orientation he reasserted a structural and cultural determinism (cf. Voget 1975).

The following two statements on the relation between man and environment go to the core of this position:

> Features of the natural habitat become significant only when and as they are introduced into cultural systems and become incorporated in them as cultural elements. ...
>
> If one is concerned with culture as a distinct class of phenomena, if one wishes to discover how cultural systems are structured and how they function as cultural systems, then one does not need to consider the natural habitat at all. (1959:51)

The second important part of White's evolutionary model (the first being his culture concept) concerns human extraction of energy from the environment. According to White, man's increasing ability to harness energy from the environment is a prime causal factor in the evolution of culture from simple social arrangements to the complexities of the present industrialized part of the world. White's emphasis on the energy factor is important and an obvious correlate of the sequential arrangement inherent in the evolution of cultures. However, his emphasis on energy and technology as causal factors has to be disputed. One may rightly search for the motive behind his insistence on the pre-eminence of technology. One reviewer argues forcefully for his ambition to develop his culturology into a science proper (cf. Odner 1979). Lastly, the combination of White's culture concept and his emphasis on the energy factor makes for an ethnocentric view of the direction of evolution.

4.4 Evolutionary approaches: An assessment

Evolutionists have mostly looked for cause-and-effect relationships in evolution. This probably stems from the fact that science traditionally has been natural science with its belief in cause-and-effect relations. Following this, cultural evolution has proposed causes of evolution, and these causes have generally taken the form of single variables or prime movers of the evolutionary process. For Childe and White and their modern day version of evolutionary theory, technological development is a prime mover.[13/] According to them, mastery and control over the environment results in ability to produce more, which leads to increase, e.g., in population, and ultimately to

cultural evolution. Technology as a prime mover has two aspects, a material and an ideational. Technology, and changes in technology, has to be viewed in relation to both these aspects. White tends to put an almost exclusive emphasis on the material aspect of technology, while Childe seems to deal also with the development of ideas and knowledge in each of the stages he acknowledges. The creation of surplus is an important corollary to this view. Surplus leads to specialization in jobs. It is also implicit in this explanation that people "lower" on the evolutionary ladder where fighting for their survival and did not manage to produce a surplus. The basic problem with prime movers is that it is not possible to establish which variable in a correlation is causal. It therefore seems more reasonable to assume a constant feedback between the two involving small changes.

Concerning the sequential aspect of evolution, both White and Childe – but especially Childe - made important contributions. However, they mix the two important aspects of evolution outlined above, namely the sequential ordering of the evolutionary process, and the question of its direction. The result is a view of the direction of evolution which in one way or another is seen as "progress". Childe and White have to be acknowledged for understanding that in order to determine and study the direction of evolution, we have to look at variables that themselves change and have a direction. In other words, when studying evolution, it is important to hold environment constant.[14/] There are two important types of these variables: (a) population growth and (b) technology and harnessing of energy. Childe and White do not touch upon how these two types of variables are interrelated, and this is probably where one should look for an answer to the problem of directional change.

A more serious criticism concerns their use of the concept of culture, and this was later to become central for Steward when he formulated his theory of multilinear evolution. Nineteenth century unilinear evolutionists tried to reconstruct particular cultures historically, but later research invalidated most of it. Childe and White were aware of this, and tried to build a model of evolution through cultural stages based on a concept of culture related to mankind. Rather than discussing cultures they ended up discussing Culture. In this way they excluded as irrelevant particular cultural traditions and micro-variations, i.e., culture areas (cf. Kaplan and Manners 1972:43-48; Steward 1955:16-17).

For all the similarities between Childe and White, there is a basic underlying difference in point of departure. Both emphasized the creative role of technology and technological invention. But while Childe maintained that the loci of technological invention are in the mode of production, White can possibly be said to locate it to the means of production. In this way Childe can be characterized as a materialist and White as a technological determinist (cf. Peace 1988).

The above discussion may have given the impression that evolutionism is viewed as outdated as regards the development of man-environment relations. This is far from being the case. Evolutionist thinking is central to the whole corpus of Steward's research, and also today these ideas are inherent to anthropological theorizing. This is, e.g., evidenced by the fertile importance of the concept of cultural adaptation in cultural evolutionary theory building (cf. Service 1968:225). Functionalist and evolutionist approaches are in a real sense inseparable (cf. Freedman 1978; Kaplan and Manners 1972). This can be seen from the two questions: How do cultural systems work? and How have they come to be as they are? Generally speaking, it is true that functionalism has tended to emphasize the former question. But as is readily understood, a theory accounting for the maintenance of a system is by implication also specifying the elements crucial in its transformation. As for evolutionism, whereas, e.g., nineteenth-century evolutionists emphasized stage-thinking, what is needed today are specifications of the variables or mechanisms that can explain transformations from one culture type to another.

Melville J. Herskovits argued against the same evolutionary position that Childe and White had set forth to correct and validate. Herskovits' point of departure developed along a line of thinking that was to be incorporated into the emerging approach of cultural ecology.

5 ECONOMIC ANTHROPOLOGY AND MAN-ENVIRONMENT RELATIONS

5.1 Background

As examples of acculturative economic processes became more and more common, a differentiation of the subfield of economic anthropology developed in opposition to the established structuralist position. These changes gradually led to the understanding that the basic structure of society was more of a pragmatic than a moral order. This was further made clear by a combination of economic and ecological processes. The implication is that important determinants of social systems are found outside these systems. Herskovits (1940) gave the initial formulation of the subject matter of economic anthropology.

5.2 Melville J. Herskovits

Herskovits studied under Franz Boas, and his teacher was to influence him strongly throughout his career.

The theories put forward by Wissler (1938) on culture areas in North and South America led to similar studies of

other cultures. Herskovits (e.g., 1930) followed up this lead and pioneered with his culture mapping of Africa. The concept of culture was as important for Herskovits as it was, e.g., for White, but in a very different way. For Herskovits, culture was learned, structured, divisible into aspects, dynamic and variable, and stemming from every component of human existence. Furthermore, its regularities permits it to be analyzed, and it is the means by which a person adjusts to the environment and expresses himself. This conception of culture, heavily Boasian-inspired, Herskovits (1955) defined as "The man-made part of the environment".

Herskovits dealt with neither possibilism nor ecology. The terms do not even appear to have been used in his two volumes on economic anthropology (1940, 1952). What then was his main concern?

He devoted his energy to criticize the prevalent ideas on unilinear evolution. These he regarded as

> ... the most important single factor standing in the way of the economist's utilizing data from primitive society as a means of broadening his concepts and checking his generalizations. (1940:36)

Herskovits would surely subscribe to the following statement by Bennett on the relation between man and his environment:

> If one neglects human choice and need in favour of an abstract superorganicist conception of human relations with the environment, interest is displaced toward an evolutionary frame of reference. Culture, or human behaviour generalized, is likely to be seen in a deterministic light ... (1976:25)

In this he was an extreme cultural relativist. This led him to criticize what he calls "economic determinism" (1940:9). By this he means the western view that holds "... economic phenomena to be a basic determinant of all other aspects of life ..." (1940:9). He suggests that there is a relationship between this view and the historical setting of the period in which this concept was developed. Herskovits argues that economists' view of primitive man is not at all in accordance with what anthropologists have found. More specifically he attacked the view that a generalized portrayal of early life could be derived from abstracting the least common denominator of all "primitive" cultures existing at present. Several economists with very different points of view, e.g., Karl Marx and Torstein B. Veblen, was marked by this evolutionary position.[15/] What Herskovits did here was pointing out to economists what was lacking in their understanding of primitive societies, why they failed in their effort to generalize, and most important of all: that the only way to go in order to understand the economies of primitive societies was through a mutual understanding between the fields of anthropology and

economy. It was in this way that Herskovits laid the foundation for the discipline of economic anthropology.

Bronislaw K. Malinowski had been interested in economic aspects of culture long before Herskovits took an interest in this. He also traced the initial connection between economy and ecology (Kuper 1973). Malinowski's followers heavily emphasized the cultural setting in which economic data had to be analyzed and understood. In the words of Herskovits they went too far in doing this, and economy to them became "... garden magic and gift exchange" (1940:38).

One of the most important elements in economic theory introduced by Herskovits is the focus on the individual in economic decision-making. He reviewed the discussion of communism versus individualism, and characterized is as shadowboxing as far as reference to primitive societies is concerned, and concludes:

> In production and distribution, even in consumption, no less than in the case of ... property rights ... the permutations and combinations of degrees of individualistic effort and reward, of group labour and the sharing of produce, are of an infinite order not to be subsumed under any formula of unilinear development, of inner correlation, or of economic law. Only when it is fully realized that in no society is the individual entirely subordinated to his group, that in no group is complete individualism the rule, can the problem be solved of the extent to which, over the world, common effort is directed toward the achievement of common ends, and where and in what situation men work and save for themselves alone. (1940:464)

In this volume Herskovits argues in favour of a relativistic attitude, and strongly emphasizes the institutionalization of values and the group-cohesiveness of human social organization. On the other hand, there is in all societies a measure of individualism. The actual working out of the relation between the individual and society and the extent to which that individual is subordinated his or her group, is culture specific and not to be referred to any economic law.

In the early 1950s the development within the sub-field already was more or less delineated as "economic anthropology" (cf. 1952). Criticisms against the ideas and broad theoretical outlook that Herskovits presented had been put forward, e.g., by Karl Polanyi (1944; Polanyi et al 1957). The different issues involved were in this way gradually made clearer, and we thus find Herskovits' position in this volume drawn to its logical conclusion.

On the question of the position of the individual, he repeated his belief in the cultural context of economic behaviour, while at the same time stating that "All choices, that is, however they may be influenced by considerations of social standing, social claims, and

social assets are ultimately the choices of individuals" (1952:7).[16/] In arguing against Polanyi and his more sociological and substantive definition of economy, Herskovits pointed out that this denied the role of individual choice. In short, "... we must not reject Economic Man only to substitute Society as an exclusive formula for understanding economic behaviour and as a basepoint for analyzes" (1952:8). He went on to argue that:

> The choices of the individual must always be limited by the resources of his society and the values of his culture. But the factors of variation to be found even within the smallest, most homogenous, and most conservative society must not be lost sight off. The economic unit, we must conclude, is the individual operating as a member of his society, in terms of the culture of this group. (1952:8)

In this argument it is evident how Herskovits balances between two opposing views. In fact, it is possible to say that Herskovits has made a compromise. This is because he combined an emphasis on the cultural context of economic behaviour and a critique of the Western concept of economics, with a "formal" definition of economics (Vaughan 1968). Put another way, although Herskovits is a declared cultural relativist, he nevertheless views economic organization in different cultures as differences in degree. On the other side there is Polanyi's substantivist position with its view that the differences are in kind.

Herskovits does not attack White directly in his critic of evolutionary approaches. In point of fact, he does not even discuss neither White nor anthropology more generally in connection with his critique of evolutionism. Although he does not deal explicitly with White, he seems to do so implicitly throughout his two volumes on economic anthropology (1940, 1952). Important here is an emphasis on the relativity of culture, a critique of evolutionary approaches as well as a critique of environmental determinism, a firm belief in possibilism, and a general emphasis on the individual and his role in decision-making and the allocation of resources.

Further developments within economic anthropology have built upon the general ideas laid down by Herskovits. And in this lies the main importance of Herskovits for cultural ecology. He contributed to the initial formulation of cultural ecology as an approach in a number of different ways. He formulated a concept of culture that included and emphasized the environment, and stressed cultural relativism. He criticized evolutionary approaches in anthropology. He furthermore realized the importance of understanding man-environment relations, and he founded and established a distinct sub-discipline of economic anthropology. However, possibly his most important contribution to the development of economic anthropology and cultural ecology, is his insistence upon cultural

relativism and the importance of the cultural context of economic behaviour, while at the same time applying a formal economic model focusing on the individual and the allocation of scarce means to limited ends. People are not all maximizing the same. Economic anthropology for Herskovits is the individual wanting to meet the wants established in that society.[17/]

After discussing Herskovits's contribution, the time has now come to turn to Julian H. Steward for a synthesis of these different ideas into what has come to be called cultural ecology of the cultural ecological approach.

6 THE CULTURAL ECOLOGICAL APPROACH

In the early 1950s the time was ripe for a reassessment of the prevalent views on the relation between man, culture, and environment; as well as the evolution of cultures. This task was undertaken by Julian H. Steward.

6.1 Julian H. Steward

From the early days of his career possibilism exerted a strong influence and was virtually the only accepted way of conceptualizing man-environment relations. At the same time a new version of nineteenth century unilinear evolution established itself and became influential for an understanding of the processes of cultural evolution.

Around the time that Kroeber published his famous volume, Steward began investigating in his own way the influence that ecological relationships exerted on the size, stability, and organization of social units and cultural systems. He used the concept "cultural ecology" for the first time in the late 1930s (1937). Steward's ideas on this topic developed and matured gradually along several different lines. Finally, in Theory of Culture Change (1955) he pulled all the different threads together into a final and coherent statement.

Steward's critique of the possibilist and evolutionist ideas very much in vogue at the time, has been presented on several occasions, and it should not be necessary to outline his point of departure here. Instead it will be useful to summarize his theoretical framework and methodology as it is presented in Theory of Culture Change. Subsequently the cultural ecological approach as defined and used by Steward will be reviewed.

The model he put forward consists of four interrelated elements: (a) cultural core, (b) the theory of multilinear evolution, (c) levels of socio-cultural integration, and (d) culture type. In the following a short presentation of these four elements will be given. For the scope of the present analysis the first two elements are most important.

Steward takes a fresh look at the concept of culture. Traditionally, the holistic conception of culture emphasizes the functional inter-dependence of all parts. While some would agree that the degree and kind of interdependence is not the same for all aspects, he went a step further and delimited a set of cultural features he found to be "... most closely involved in the utilization of environment in culturally prescribed ways" (1955:37). He called this set of features "cultural core", and defined it as

> ... the constellation of features which are most closely related to subsistence activities and economic arrangements. The core includes such social, political, and religious patterns as are empirically determined to be closely connected with these arrangements. (1955:37)

In addition there are all the cultural features that are not tied as intimately to the core. These features are determined by cultural and historical factors like random innovation and diffusion.

A central physical-environmental component was also located, and this component, together with the cultural core, constitutes the central causal mechanism in human societal adaptation to its environment. Not only that, it is proposed that this causal mechanism influences other aspects of culture, and that this is true both historically and geographically. As opposed to earlier conceptions of man-environment relations, Steward's cultural ecology contained a feedback process as an implicit part of the model, i.e., how adaptation influenced other parts of culture. In this way Steward pioneered in introducing systemic processes into the analysis.[18/] The focus of these ecological adaptive processes are accordingly "... not simply ... the human community as part of the total web of life but ... such cultural features as are affected by the adaptations" (Steward 1955:39). According to Voget, Steward's "... persistent attempts to systematize ecological theory and method were largely responsible for the increased attention to ecology and social systems that took hold in the fifties" (1975:695).

Steward argued that cross-cultural ecological studies of particular groups would give a typology of cultures based on each culture's specific adaptation. This methodology and argument is directly connected to his "theory of multilinear evolution". Steward agreed that cross-cultural regularities existed. He was, however, deeply opposed to the view that such regularities must pertain to all human societies:

> Multilinear evolution is essentially a methodology based on the assumption that significant regularities in cultural change occur, and it is concerned with the determination of cultural laws. ... It is inevitably concerned also with historical reconstruction, but it does not expect

> that historical data can be classified in universal stages. It is interested in particular cultures, but instead of finding local variations and diversity troublesome facts which force the frame of reference from the particular to the general, it deals only with those limited parallels of form, function, and sequence which have empirical validity. ... It recognizes that the cultural traditions of different areas may be wholly or partly distinctive, and it simply poses the question of whether any genuine or meaningful similarities between certain cultures exist and whether these lend themselves to formulation. (1955:18-19)[19/]

Steward's emphasis on cultural evolution led him towards studying both historic and modern complex societies. He devised the concept "levels of socio-cultural integration" as an operational tool in analyzing complex societies. According to this, features of a complex culture can be analyzed on two levels. There are first those features that have to be studied on a national level, and secondly the features that are connected with subgroups of the population. Cultural development implies increasing complexity or quantitatively new patterns, but also qualitatively new patterns. These qualitatively new patterns must be conceptualized exactly as the emergence of successive levels of socio-cultural evolution.

Possibilism's emphasis on the concept of culture-area was not useful to Steward's analysis. He therefore defined the concept "culture type" consisting of core features that, firstly, are determined by cross-cultural regularities of cultural ecological adaptation, and, secondly, represent a similar level of socio-cultural integration. These two factors represent a synchronic, functional; and a diachronic, developmental mode of analysis, respectively. By this Steward wanted to correct the simplicity of the earlier culture-area typology.

To summarize, cultural ecology is characterized by seeking to establish how and in what way different aspects of cultures are differently affected and changed as a result of these cultures' adaptation to their environment. A causal mechanism in this adaptive process is proposed. Cultural ecology does not deal with long-term and long-range generalizations that are applicable to any cultural-environmental situation. Rather, it concentrates on explaining particular cultural features and patterns characteristic of different areas. The goals of cultural ecology are therefore more limited both in time and space. It further stresses that culture must be related to the local environment. In this way an effort is made to construct an argument whereby culture does not end up as both subject and object. In one of his last statements on cultural ecology he thus argues that it is

> ... the study of the processes by which a society adapts to its environment. Its principal problem is to determine whether these adaptations initiate

> internal social transformations or evolutionary change. (1968:337)

Steward's theoretical background and point of departure is strongly connected with possibilism. His aim was to correct the fallacies and inherent limitations of the possibilist conception of man-environment relations. Together with White he felt the need for establishing generalizations. They did this by emphasizing the material component in culture. Combined with the evolutionary views they put forward, this reflected their desire to rise above the theoretical limitations of Boas and his tradition of historic particularism (Hatch 1973).[20/] It is, however, still important that cultural ecology be historical and typological in objective and method. According to Steward, "... the problem is to determine whether similar adjustments occur in similar environments ...", and to follow these "... through a succession of very unlike periods ..." (1955:42).

In this respect Steward's model can be viewed as a logical continuation of certain tendencies inherent in possibilism. He criticized the concept of culture-area rightfully (1955:78-97), but the alternative he came up with, although including an environmental-ecological component, ended up as a revised form of possibilism. It therefore seems that Steward followed his predecessors in his preoccupation with culture areas. It is nonetheless correct to say that his concept of the cultural core is built on the fact that some aspects of culture and environment are more important than others. It should furthermore be stressed that the concept's analytical usefulness and its heuristic force lies in the obvious fact that if one include everything the concept becomes less manageable. As a model, what one would gain in complexity, one would loose in clarity.

Throughout his writings he emphasized the importance of including the environment in the analysis. Ecological analysis was however not his major interest. He was primarily interested in the explication of cultural processes as well as using cultural ecology as a methodology for building evolutionary theory (Frake 1962; Kaplan and Manners 1972).

The two concepts adaptation and environment are very central to cultural ecological analysis. Their meaning and use have developed along with the development of ecological approaches within anthropology. Viewed from within the somewhat limited Stewardian cultural ecology, it seems to be somewhat difficult to say much concrete on these concepts. He appears, however, to acknowledge that their meaning can differ over time, and that this especially concerns the concept environment (see Note 14++). Accordingly, Steward (1968) states that the degree of determination of environmental factors over culture declines as technology advances. And since environment and adaptation are intimately related, the adaptive processes will also change. In recognizing this, Steward avoided a serious tautological analytical trap. Cultural evolution

explained in terms of environment, as well as the concept adaptation used in an explanatory context, easily turned into circular arguments in much of the cultural ecological work. For his part, Steward among other things focused on social organization among the Great Basin Shoshonean Indians as a means of adaptation, and this is basic to an understanding of cultural ecology.[20/]

Steward does not seem to have offered any definition of adaptation or environment. Reference has earlier been made to the definition of adaptation offered by Johnson (see p. 15), and this seems to have grasped a crucial part of Steward's contribution. At first glance it may seem like a rather vague definition for such an important concept. It does, however, emphasize something very important, namely adaptation as an approach. In this way it becomes not a theoretical but an empirical problem, in other words a perspective.[22/] Adaptation thus is the specific perspective one brings along into the field, the questions one asks on why and where. Evolution is the general perspective, and one has to move back and forth between these two somewhat separate traditions. They refer to different aspects of the same problem (Johnson 1979). Adaptation is for this reason also called specific evolution or multilinear evolution to use Steward's label (see Table 1). In this way adaptation can be viewed as evolution in action. It is an interesting fact that Elman R. Service, together with Marshall D. Sahlins, are largely credited for putting forward these ideas on “general” and “specific” evolution. Both were students of Steward and White, and this can maybe be seen as en effort to synthesize the positions of their teachers.

Steward was critical of Childe and White, and he formulated an alternative view on evolution in the above mentioned concept of multilinear evolution (see also p. 17). This he contrasted with Childe's and White's models, which he termed "universal evolution" or "unilinear evolution" (1955:11-19). It now seems clear that Steward’s reviews of Childe were not well founded, and this also goes for his characterization of Childe’s and White’s positions as almost indistinguishable. In the opinion of Peace (1988), Steward’s argument and position was so strong as to be accepted by almost everybody. This especially goes for Childe after his characterization of him found its way into influential general works on anthropology and evolution. A likely explanation for Steward’s argumentation is that distancing himself from Childe and White served his purpose in putting forward his own brand of evolution, namely multilinear evolution. Peace (1988) argues that Steward furthermore implicitly in this way have tried to distance himself also from Marxism.

It has been pointed out that there are significant complimentarity between Steward and White in the way they conceptualize the evolutionary process as dichotomized in general evolution and specific evolution (see Table 1; cf. Kaplan and Manners 1972:48-49). There is also an interesting divergence from possibilism here, for

possibilism emphasized divergent development. While agreeing, Steward (1955) stressed that there are also significant parallels in cultural history. Moreover, the nature of the evolutionary processes in biology and culture differ markedly. Thus, while biology is characterized by divergent, and to some extent convergent evolution, cultural evolution on the other hand is characterized by a multiplicity of cultural patterns that are interrelated and still pass through parallel sequences. Childe, however, is quite explicit in viewing cultural evolution as essentially convergent and resulting from diffusion. Steward criticizes Childe and White for in this way evading difficult facts like cultural divergence and local variation by talking in the singular. Steward himself is interested in particular cultures, but he evades the facts of local variation. This forces him to use a more general frame of reference by dealing only with the more limited aspects of cultures that are valid empirically, i.e., the cultural core.

Cultural ecology to Steward "... presents both a problem and a method" (1955:36). The problem of cultural ecology has already been dealt with at some length. In short, it is

> ... to ascertain whether the adjustments of human societies to their environments require particular modes of behaviour or whether they permit latitude for a certain range of possible behaviour patterns. (1955:36)

The method of cultural ecology has been referred to. It is now time to present his methodological program briefly. It consists of three parts:

> First, the interrelationship of exploitative or productive technology and environment must be analyzed. ...
>
> Second, the behaviour patterns involved in the exploitation of a particular area by means of a particular technology must be analyzed. ...
>
> The third procedure is to ascertain the extent to which the behaviour patterns entailed in exploiting the environment affect other aspects of culture. [underlining by author] (1955:40-41)

The third of these steps is the most important, in that through this, systematic processual and synchronic data useful in studying evolutionary processes are gathered.

The importance of the new developments within the emerging field of economic anthropology, and Herskovits in particular, has been dealt with. Suffice it therefore here to discuss a few points pertaining to the relation between cultural ecology and substantivism, and more generally between ecological anthropology and economic anthropology.

To Steward with his theoretical background in materialism and Marxism, Herskovits' interest in economy made sense. Another reason was of course that Herskovits

emphasized the environment in his definition of culture. Herskovits was preoccupied with acculturative processes, and so was Steward. The acculturation of indigenous cultural systems and their gradual incorporation in wider economic systems necessitated a new conceptual apparatus. Steward's partial answer to this was the concept of levels of socio-cultural integration.

Another issue which Herskovits emphasized was however only implicit in Steward's theoretical framework. He never followed up Herskovits' concentration on the individual and her or his rational choice.[22/] This can be seen also from a comparison of substantivism and cultural ecology (Earle 1980): both are functionalistic in their approach. The point of departure is, however, different. Substantivism starts with the institutions, and cultural ecology with environment.[24/] This is proof of the limited importance that Herskovits' emphasis on the individual had on Steward's cultural ecology. For Steward, cultural ecology was an extension of functionalism to include the relations between human populations and their environment. However, his emphasis on the environment largely precluded an interest in the individual.

More generally, ecological anthropology and economic anthropology share basic descriptive interests in production and exchange. The distinction between them is partially artificial and can to some extent be traced to the fact that "ecologists" traditionally studied simple, egalitarian societies, while "economists" traditionally studied stratified societies. Part of the difference is also owing to economists' close adherence to the maximization framework of neo-classical economics (Johnson 1979).

From the sixties onwards Steward's cultural ecology gradually came under attack as knowledge of man-environment relations increased. Two major criticisms were raised against him.

First of all, the central concepts in his model, i.e., cultural core, adaptation, environment, system, and social institutions; were found to be too vague and difficult to operationalize. Johnson, e.g., states that the definition of cultural core "... lacks theoretical and methodological precision" (1978:31). Netting (1968) built upon Steward's theoretical insights in his Kofyar-study. He did however depart from Steward in some respects, e.g., his concept "social institutions" Netting found to be not concrete enough. Bennett (1976) advocates a policy-relevant cultural ecology, i.e., cultural ecology must be judged on its performance and utility in this respect. For Bennett, the concept cultural core apparently is difficult to operationalize and put to use in a policy-relevant cultural ecological analysis. Since, however, Steward purports to deal with questions of cultural evolution; it would seem that Bennett's preoccupation with the policy-relevance of cultural ecology is criticizing Steward for something he never aimed at.

The other important set of criticisms put forward deal with the systemic aspects of cultural ecology, or more specifically the question of causation. Steward saw ecological processes as primary causal forces in cultural evolution. The various concepts interrelated in his cultural ecology seem to emphasize linear causation from the techno-economic core towards social forms, or the cultural core (see Note 13++). This seems, e.g., to be the case in his analysis of Shoshonean adaptation in the Great Basin environment (1955:101-21). However, as cultures become more and more complex, man's environment becomes more and more a cultural environment. One would accordingly expect the direction of causation to gradually move from culture to biology rather than the other way around. In his later writings Steward (e.g. 1968), acknowledged and repeatedly emphasized this.

7 CONCLUSIONS

Steward's model of man-environment interrelations is today viewed as too simple. Moreover, the primacy he gave to ecological processes as causal agents is just not something that one á priori assumes. They are on the contrary the result of an empirical analysis. The reason why Steward is not more interested in the interplay between the cultural core and the physical-environmental component, as well as the implicit notion of a systemic feed-back, is of course connected with his lack of interest in choice and decision-making processes. Steward therefore ended up as a somewhat deterministic and certainly typological and possibilistic theoretician.

In this lie the main constraints of Steward's cultural ecology. And in this one also find what came to be emphasized in the further developments of ecological analyses within anthropology. These later developments are on the one hand taking place within the area of systems-oriented approaches, more specifically general systems theory and systems analysis that emphasizes more complex patterns and interdependency, i.e., reciprocal causal connections. On the other hand there are the choice- or decision-oriented approaches. The latter developed partly as a reaction to and partly parallel to the system-oriented approaches. These approaches put more emphasis on peoples' conscious adaptation to the environment. Peoples' decisions or choices are seen as part of the system. The focus in these analyses is accordingly on peoples' strategies in relation to the environment.[25/] Arguments along the lines of one of the central theses of this study concerning a continual interaction between science and society (specifically regarding culture and ideology), seems important also in the post-Stewardian developments in ecological anthropology.[26/]

More generally, Steward's cultural ecology has been developed along various directions including a

"culturological" and an "environmental" type by a host of different theorists. Throughout these developments the basic position of anthropology as a social science is becoming more and more obvious. This is that these sciences include social phenomena as part of the environment that humans have to cope with. The central problem that Steward's cultural ecology confronts, namely of delimiting the relative importance of social and physical-environmental factors in determining human behaviour and culture, is still far from being resolved. Steward must however be credited for beginning this process of formalizing the ecological perspective by understanding that the physical-environmental parameters of cultures greatly influence the potentials for cultural development.

The development in the social sciences – in all sciences in fact - takes place within, and has to be understood within, an intricate matrix of larger cultural systems comprising science and society. Within clear limitations of time and space, this study has made a tentative effort to point out some of these science-society interactions involving anthropology. It would seem that this important relationship and interaction between anthropology and society so far has not received enough attention by anthropologists, and this study is intended as a limited contribution towards this. The important mutual relationship between science and society does not seem to have diminished in post-Stewardian developments in anthropology. Furthermore, there are indications that the relative impact of science on society is gradually increasing, and that this also goes for the social sciences including anthropology.

APPENDIX:

SUPPLEMENTARY BIOGRAPHICAL DATA

Note: The order used in listing these scholars is intended to convey a somewhat impressionistic perception regarding the temporal succession and progression in the development of man-environment relations.

Sources: Beals (1968), Carneiro (1979), Douglas (1979), Kuper (1973), Merriam (1964), Murphy (1979), Odner (1982), Treistman (1968), Vaughan (1968), Voget (1975), and Wallis (1968)

Clark Wissler (1870-1947)

Wissler received a Ph.D. in psychology from Colombia University but gradually oriented himself towards anthropology, and later taught at Yale University. He was especially interested in the Plains region.

Alfred L. Kroeber (1876-1960)

Kroeber received a Ph.D. from Colombia University, and his career coincided with the development of professional anthropology in the United States. Working out of the University of California at Berkeley, most of his work centred on the California Indians. He was maybe the last to make significant contributions to all subfields, and was very influential.

V. Gordon Childe (1892-1957)

Childe was born in Australia, but studied in England, and the whole span of his academic career took place there. He early became heavily influenced by Marxism. This influenced both his involvement in labour politics and his scholarship. After holding a chair in prehistoric archaeology, he was appointed director of the London Institute of Archaeology after the Second World War. He was widely regarded as an eminent scholar, and had a near total command of the field.

Melville J. Herskovits (1895-1963)

Herskovits became interested in Africa early, and did his doctoral thesis at Colombia University on the cattle complex of East Africa. Africa and the New World Blacks continued to occupy him throughout his career. Backbones of his conception of anthropology were a strong humanism and a heavy reliance on the utility of the inductive method in an anthropological context.

C. Daryll Forde (1902-1973)

Forde was born in England and studied at University College London, where he wrote his thesis on prehistoric archaeology and lectured in geography. Here he worked with British migrationists and argued in favour of the theory

of Egyptian origins. In the 1930s he held a chair in geography and anthropology at the University of Wales, and pursued theoretical interests in the interface between human geography and archaeology. In the late 1920s he carried out fieldwork in Arizona and New Mexico, and his association with American studies remained evident in publications. Subsequent fieldwork among the Yakö in Nigeria marked a turning point away from archaeology towards anthropology. After the Second World War he was appointed director of International African Institute and also received at chair in anthropology at University College London.

Lesley A. White (1900-1975)

White studied under among others Edward Sapir, and received his Ph.D. from Colombia University. Renowned as a theorician, he was also an avid fieldworker especially in the Southwest. During most of his academic career he was affiliated with the University of Michigan. His culturological approach was not specifically ecological in nature, but he was also concerned about the importance of the environment as a causal agent.

Julian H. Steward (1902-1972)

Steward came from the east coast, but did his graduate work at University of California at Berkeley under Alfred L. Kroeber and Robert H. Lowie. After a brief spell of teaching and fieldwork in the Great Basin (the latter giving rise to his theory of cultural ecology), he moved east in the mid-1930s. Working out of the United States Bureau of American Ethnology and the Smithsonian Institution, he edited and also contributed to the Handbook of South American Indians. He then focused on the modern Latin American cultures, and integrated this with earlier work into a new field termed "area studies". In turn, this interest in complex societies led to his theory of cultural evolution. In the late 1940s, at Colombia University, he organized a large project in Puerto Rico along lines of his area studies approach. From here he moved on to University of Illinois where he pursued his interest in complex society.

NOTES

1/ Three other terms have been, and are still being used, to cover partly the same and partly different areas of thought. They are "human ecology" (Bennett 1976), "cultural materialism" (Harris 1968); and "ecological anthropology" (Hardesty 1977). Today it is probably fair to say that the term “ecological anthropology” is used as a more or less general term covering the whole domain of ecological interests in anthropology comprising several more or less distinct sub-fields.

2/ In addition to the literature mentioned explicitly in this study, it has benefited from a number of mainly older review articles and books, among them: Abbott (1970), Anderson (1973), Baker (1962), Cook (1973), Diener (1980), Freilich (1963, 1967), Geertz (1963), Harris (1968), Helm (1962), Hirschfeld et al (1982), Klausen (1981), Lowie (1937), Orlove (1980), Rappaport (1971), Slotkin (1965), and Vayda (1969).

3/ For exhaustive treatments on the concepts of “adaptation” and “environment” in an ecological anthropological context, cf., e.g. Alland (1972, 1975), Alland and McCay (1973), Bargatzky (1986), Bennett (1976), Burnham and Ellen (1979), Cohen (1968-70), Dyson-Hudson and Little (1983), Ellen (1982), Kaplan and Manners (1972), Keesing (1974), Moran (1982), Vayda and Rappaport (1968), and Young (1986).

4/ Cf. Bennett (1976) for a further discussion on this. See also p. 13.

5/ Due to this, there developed an early interest in ecological problems within American anthropology (cf. also Hatch 1973), while European anthropologists largely focused on economic processes. Although there has been interesting developments in Europe, this study concentrates on the developments within American anthropology. A note on development of ecological studies in anthropology in Europe may therefore be of interest at this point. Malinowski based his theory on the assumption of man's biological and physical needs. However, his interest in ecology and economy was obscured by the later strong structural-functional culture-oriented view of Alfred R. Radcliffe-Brown and followers, and it was not until long after the absorption of Malinowskian bio-cultural functionalism by Radcliffe-Brown's social anthropology, that ecology and economy again emerged as issues of primary importance (Kuper 1973; Voget 1975). Three other European anthropologists should be mentioned here: Fredrik Barth, C. Daryll Forde, and Audrey I. Richards. Barth (1950, 1956) pioneered in the analog use of biological concepts on social data, in this case the concept of “niche”. Interestingly, Barth’s early focus on ecological issues started out during formative years at the University of Chicago in the late 1940s. Forde worked as a professional

anthropologist in America, and will therefore be discussed elsewhere in this study. Richards' monograph from Rhodesia (1939) is important for two reasons. Firstly, it paved the way in American anthropology for a new orientation towards applied studies of "food habits". Secondly, it pioneered in the detailed way it described how subsistence pattern and resource use were organized by the social system. This study in a typical British tradition was new to American anthropology. Mention should also be made of V. Gordon Childe, originally an Australian archaeologist that worked in England. He had a long and lasting influence on American anthropology and is discussed elsewhere in this study.

6/ European culture historicism started out with a heavy emphasis on diffusion. The British migrationists were most extreme in believing that borrowing was almost the only method by which culture change took place, invention practically never occurring. The apotheosis of this was Grafton E. Smith's theory of ancient Egypt as the cradle of culture on a global scale. The German-Austrian school propagated a modified diffusionist view, based on history and to some extent psychological factors, whereby the large culture unit, or "Kulturkreis", spread to large parts of the early world from a number of centres of diffusion. Diffusion studies in both England and the United States declined around 1930.

7/ It is interesting that according to Bennett, the use of the age area concept and what he views as "... its translation into the culture area ..." (Bennett 1976:169), is another example of the analog use of biological concepts in analyzing social data (cf. Note 5++). When this was done, he continues, "... the qualifying factors were ignored and the impression was given that a lawful regularity in human behaviour, below the level of consciousness of the actors involved, had been discovered" (1976:169).

8/ These food or subsistence areas refer primarily to the basis of culture, although environmental factors apparently to some extent also are involved (cf. Kroeber 1963:6).

9/ For an informative and condensed presentation of the early history of the concept of evolution, cf. Service (1968:222-25).

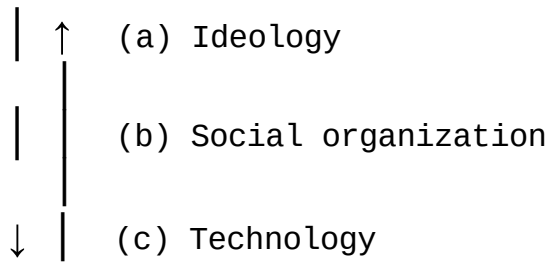
10/ Childe views the economic as political economy, i.e., individuals will maximize and get as much for themselves as they can. Childe here takes a formalist position. In his application of Marx, technology together with social arrangements and specialization (i.e., division of labour), generates surplus, which is the substance states are made of. Some people have to be free to experiment and acquire. Mastery brings about emancipation from Nature. Surplus in this sense has something natural about it – it just comes about.

Childe did not regard the state as unnecessary; he saw that it had certain functions. He therefore concluded by emphasizing the need for the state, and the opportunity for self-aggrandizement. Childe can be attacked from a substantivist position. There is no society where people live on or below minimum. People have a socially and culturally determined definition of the minimum biological need. Furthermore, if people produce more it follows that this is done because there is a state-mechanism that let this happen. Potential surpluses are universal, what counts is the institutional means for mobilizing them (Wolf 1966).

11/ Childe's somewhat inconsistent application of Marxist theory led to his defence of the state. This must, at least in part, be seen in light of the way he viewed the causal importance of technology, the importance he puts on surplus, as well as his ethnocentric evolutionary ideas concerning the direction of evolution.

12/ Turning to the cause of evolution, Childe can be read as in reality arguing that population growth is dependent upon subsistence. According to Hardesty (1977) Childe's argument run as follows: The abundance of foragers is severely restricted by a low carrying capacity, but the adoption of farming raises the carrying capacity and makes possible a "population explosion". Hardesty concludes that this is a possibilistic and optimistic view of population growth. While agreeing, Treistman (1968:392-93) does also seem to read Childe as arguing partly for a pessimistic view on population growth.

13/ Technological development as a prime mover in cultural evolution has been labelled the "layer-cake approach":



This is reminiscent both of the difference between "base" and "superstructure" in Marxism, as well as of Steward's conception of the relative causal importance of various cultural elements (see pp. 26-28). For a diagram summarizing Steward's causal model, cf. Kaplan and Manners (1972:47). Harris (1980) gives one of the latest statements of the layer-cake approach. The other well known prime mover is population increase. Its best known advocate today is Boserup (1965). According to her, population increase leads to competition for scarce resources which results in evolution. Evolution thus takes place not to improve the quality of life, but to keep it constant, and it is therefore a pessimistic view. The whole process is

considered to be automatic. This pessimistic view of evolution is opposite to the optimistic view advocated by Childe and White.

14/ Here it is important to keep in mind that human intensification of production fundamentally changes the habitat, and in predictable ways. Conversely it is important to hold culture constant when studying adaptation.

15/ For an assessment of the import of Veblen's work on anthropology, cf. Herskovits (1936). As for Marxism, Herskovits states that "Marxism as a school of economic thought is just as restricted in its approach as the neoclassical school, because its analysis is based almost entirely on data drawn from our own society" (1940:31).

16/ Herskovits is here followed by Bennett (1976) in an indirect criticism of possibilism for its lack of consideration of individual choice, which in its turn lead to a kind of evolutionary framework.

17/ The concept "want" is important. Economists take wants for granted. People have wants because they want them. Wants are given, it is up to the individual to define them. Accordingly formalism deals with the individual and the individual's choice. This approach is related to the theory that the individual tries to maximize hers or his values. Anthropology's interest in wants, on the other hand, tends to be in where they come from. For Polanyi and other substantivists, wants are concerned with values. People want what they learn to want. Wants are acquired in the community, they are part of the cultural background. Put another way: The economy is embedded in the society. And vice versa: The society determines the economy. (For a discussion of the difference between substantivism and cultural ecology as shown in the use of these concepts, see Note 24.++)

18/ The concept "system" as used in the social sciences is vague and has proved difficult to operationalize. The major problem may be in defining the borders of a system. Cf. Kaplan and Manners (1972) and Moran (1984) for a thorough discussion on this, including the relation between the concepts of system and environment. For a recent review of the terms "system" and "process" in ecological anthropology, cf. Vincent (1986).

19/ For an exploration of the effect of technically similar adaptations on the social structure of two widely separated marginal cultures, cf. Steward and Murphy (1977).

20/ Nonetheless it seems that Steward's concept of culture to a large extent derived from Boas and his emphasis on cultural explanations.

21/ Cf. Kaplan and Manners (1972:77-87) for a fairly thorough overview over the problems inherent in the

use of the two concepts of adaptation and environment. The Shoshonean case is presented and analyzed in Steward (1955:101-21). The emphasis on adaptation, environment, and causality is basic also to the substantivist approach to economy discussed above, although it is not very elaborated.

22/ Cf., e.g., Steward's “cultural core”, where its specific content has to be dealt with through collection of data.

23/ Cf., e.g., Bennett (1976:166), who criticizes Steward for lacking any conception of the importance of the individual and how she or he through voluntary choice-making manipulates and selects from the environment. The crucial factor of human adaptation through this new emphasis becomes important in post-Stewardian cultural ecology.

24/ This difference between substantivism and cultural ecology is connected with some other notable differences regarding the concepts "wants" and "means". In substantivism, wants are seen as the outcome of values, while the means are found and defined within the culture. Cultural ecology studies wants in terms of needs (wants are more than needs, but it is a beginning). Means are understood in terms of the environment (cf. Cook 1973). (For an elaboration of the difference between the formalist and substantivist positions regarding these concepts see Note 17.++)

25/ On individuals and strategies, see Note 23.++ For examples of tentative overviews and preliminary efforts at synthesizing recent development in man-environment relations, cf., e.g., Anderson (1973), Bargatzky (1986), Bennett (1976), Ellen (1982), Freedman (1978), Hardesty (1977), Kaplan and Manners (1972), Moran (1982, 1984), Orlove (1980), Ortner (1984), Vayda and McCay (1975), Vincent (1986), and Voget (1975).

26/ For explication of these and related issues, cf., e.g., Dumont (1979), Hagendijk and Cramer (1986), Hirschfield et al (1982), Nugent (1988), and Ortner (1984). Dealing more specifically with American anthropology, there is a growing interest in studying the history of anthropology, specifically focusing on the Boasian-Marxism interface and interfusion (cf., e.g., Stocking 1984, 1986).

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