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A New Ecological Paradigm for Post-Exuberant Sociology

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The changed ecological conditions confronting human societies seriously challenge sociology, for the discipline developed in an era when humans seemed exempt from ecological constraints. Disciplinary traditions and assumptions that evolved during the age of exuberant growth imbued sociology with a worldview or paradigm which impedes recognition of the societal significance of current ecological realities. Thus, sociology stands in need of a fundamental alteration in its disciplinary paradigm. The objectives of this article are to make explicit the "Human Exemptionalism Paradigm" implicit in traditional sociological thought, and to develop an alternative "New Ecological Paradigm" which may better serve the field in a post-exuberant age.

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Specifically, we will begin by briefly tracing the historical roots of "exemptionalist" thinking in sociology, noting first its origins in Western cultural traditions, and then the unique disciplinary factors that reinforced it for sociology. Next we will describe the nature of the changed ecological conditions facing human societies that require a fundamental reorientation by sociologists, no less than of other people. Then we will turn to an explication of the emerging ecological paradigm, showing how it seems to be affecting sociological inquiry. Finally, the distinction between this new ecological paradigm and the traditional exemptionalist paradigm will be compared with more standard theoretical cleavages within sociology. This comparison will illustrate the importance of the new paradigmatic cleavage.

DOMINANT WESTERN WORLDVIEW

To understand the challenge now facing sociology, it is essential to know how deeply sociological thinking has been influenced by a worldview long prevalent in Western culture—a worldview now made increasingly obsolete by recent change. Western culture has a strong anthropocentric tradition, viewing humans as separate from and somehow above the rest of nature (White, 1967). Accumulation of scientific knowledge and the growing power of technology converted this ancient anthropocentrism into modern arrogance toward nature (Ehrenfeld, 1978; Sessions, 1974), while European expansion into the New World added a strong sense of optimism.

Profound cultural impact followed when European people gained access to a second hemisphere's carrying capacity surplus.[1] At the time Columbus embarked on the voyage that was to reveal the availability of new lands, there were about 24 acres of Europe per European. Soon afterward, however, with new continents to settle and exploit, there were suddenly some 120 acres of land per European (Webb, 1952). Using land area as a rough measure, carrying capacity was thus increased fivefold. Opportunities thereafter seemed limitless. Accordingly, the number of Europeans and the extent of their "range" expanded "exuberantly" (to use the language of the ecologist). The 400-year boom described by Webb was a human instance of the "age of exuberance" that may occur for any species population when it gains access to a substantial increment of carrying capacity. In this situation it is not surprising that an optimistic belief in "progress" developed.

Abundance, so characteristic of this age of exuberance, was especially salient for the development of American traditions, values, and expectations (Potter, 1954)—since it was in America that the new abundance was most pronounced. Yet, as extreme as it became, American optimism and faith in progress differed only in degree from that of other nations participating in the "industrial revolution." This revolution, fueled both by New World resources and new technologies providing access to the earth's seemingly vast supply of fossil fuels, created an abundance throughout the Western world previously unknown on such a large scale.

As trade and cultural diffusion among nations expanded, virtually all industrialized countries came to share an optimistic worldview entailing an expectation of perpetual progress and a prodigal attitude toward nature. Thus, Watt et al. (1977: 13) describe the industrialized world's "technoculture" as "a paradigm that transcends national identity and political ideology," while Pirages (1978: 260-261) points to a "dominant social paradigm" shared by industrial nations, and Harman (1979) describes an "industrial era paradigm."

We prefer to follow Black (1970: 19-28), who speaks of a dominant "Western Worldview." While this "worldview" concept is imprecise, and its history more complex than we have been able to suggest (see Passmore, 1974: Chap. 2; Sessions, 1974), there is nonetheless considerable consensus on its basic tenets (Black, 1970: Chap. 2; Ehrenfeld, 1978: Chap. 1; Watt et al., 1977: Chap. 2; White, 1967). Although any listing must be somewhat arbitrary, we believe the Dominant Western Worldview can be represented by the following four beliefs:

(1) People are fundamentally different from all other creatures on earth, over which they have dominion.

(2) People are masters of their destiny; they can choose their goals and learn to do whatever is necessary to achieve them.
(3) The world is vast, and thus provides unlimited opportunities for humans.
(4) The history of humanity is one of progress; for every problem there is a solution, and thus progress need never cease.

Because this anthropocentric and optimistic set of beliefs is so patently unecological, it is now being challenged by recent experiences with changing conditions of life. Accordingly, several writers (e.g., Harman, 1979; Pirages, 1978; Watt et al., 1977) have begun to call for its revision to fit the changed circumstances now facing mankind.

DISCIPLINARY TRADITIONS IN SOCIOLOGY

It is not surprising that sociology, which developed in nineteenth-century Europe and prospered in twentieth-century America, reflects the optimistic anthropocentrism of the Dominant Western Worldview—for scientific endeavors are often influenced by the sociocultural milieu in which they develop (Merton, 1968: 510-542). Thus, a somewhat sophisticated version of anthropocentrism can be found in widespread sociological adherence to what Klausner (1971: 11) has called "human exceptionalism," or the "belief in an evolutionary discontinuity between man the symbolizer and other biological creatures" (also see Burch, 1971: 14-20). Similarly, an optimistic faith in social progress has been a venerable part of the heritage of sociologists, being particularly prominent in the work of the discipline's founder, Auguste Comte (Timasheff, 1967: 20-21, 27-29).

However, certain factors distinctive to sociology also contributed to its adoption of an ecologically unsound set of assumptions about human societies. In order to establish their new discipline the founders of sociology, both in Europe and America, strongly asserted the uniqueness of its subject matter and its perspectives. Of fundamental importance in this regard

was the Durkheimian emphasis on the "objective reality of social facts" such as norms, groups, and institutions, and the irreducibility of such facts to the psychological properties of the individuals involved (Durkheim, 1950: Chap. 1; also see Ritzer, 1975: 25-26). As Timasheff (1967: 313-314) noted in his review of mid-twentieth-century sociology, "*social* phenomena, the subject matter of sociology, are now commonly recognized to be *sui generis,* in other words, to be irreducible to non-social facts."

A corollary of this sui generis conception of social facts is Durkheim's (1950: 110) dictum that "The determining cause of a social fact should be sought among the social facts preceeding it." In other words, the cause of a social fact must always be another social—as opposed to psychological, biological, or physical—fact. Although Durkheim was primarily concerned with combatting the tendency to explain social phenomena with psychological variables (i.e., to *reduce* social facts to "states of individual consciousness"), what we may call his "anti-reductionism taboo" was general enough so that it also ruled out the use of biological and physical variables as explanations of social phenomena.

We can see the effects of this anti-reductionism taboo, which became normative in sociology (Timasheff, 1967: 314), by tracing the development of important conceptual distinctions among the variables that influence human behavior. At the earliest stages of social thought, it seemed human behavior was to be explained in terms of an undifferentiated concept such as "human nature" (Dewey, 1937)—i.e., people acted the way they did because it was human nature to do so. However, as biological knowledge developed sufficiently to provide a theory of heredity, it facilitated distinction between "heredity" and "environment" as sources of variation in human behavior patterns (Bernard, 1922). While this distinction did not logically require that either source be eliminated from further investigation, anti-reductionism (in the form of anti-biologism) induced sociologists to choose not to be "hereditarian."

To make further conceptual progress, sociologists had to go on to distinguish social and cultural environments from physical and biological environments (Bernard, 1925: 325-328). Again

not logical necessity but an anti-reductionist taboo against "geographical (or environmental) determinism" restricted and distorted sociological recognition of the salience of physical environments (Klausner, 1971: 4-8; Choldin, 1978: 353), while the anti-biologism taboo precluded much sociological attention to the ecosystem context and consequences of human life (Burch, 1971: 14-20).

These important disciplinary developments are illustrated in Figure 1, where the two conceptual "forks" just described are schematically represented: first the distinction between environment and heredity, and second, the distinction between social and cultural environments, on the one hand, and biological and physical environments (or simply the "biophysical environment") on the other. Note that *moving* from left to right in the diagram represents achievement in making distinctions between one kind of causal influence and another, while *expanding* the vertical dimension represents increasing recognition of diversity in these causal influences. Also note that advance from left to right need *not* be equated with a unidirectional (upward) shift on the vertical axis.

However, sociology, in its quest for disciplinary autonomy, has always tended to shift its attention "upward" as each conceptual distinction was made. That is, having learned to *distinguish* environmental from hereditary influences on behavior, sociologists assumed that the "lower" one was thenceforth to be *disregarded.* Again, having distinguished social and cultural environments from biophysical environments, sociologists assumed that the latter could safely be ignored. In other words, each time a conceptual distinction was made, the anti-reductionism taboo led sociologists to ignore the "lower" class of variables and focus attention on the "emergent" level. This tendency is epitomized in Stanley's (1968: 855) assertion that "the main accomplishment and direction of the social sciences to date [is] the progressive substitution of sociocultural explanations for those stressing the determinative influence of physical nature."

In addition to the Durkheimian legacy, with its emphasis on social facts and anti-reductionism, another major tradition in

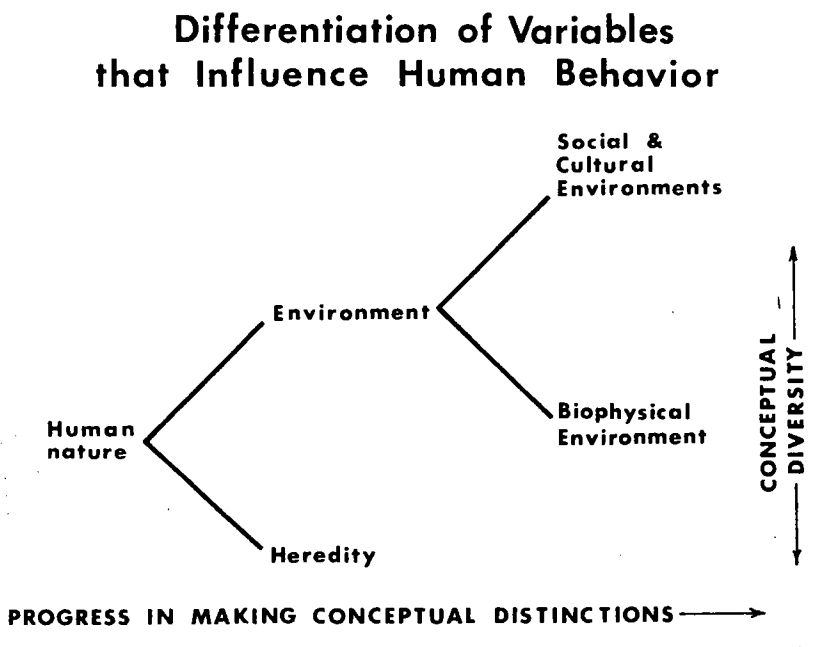

Figure 1: Differentiation of Variables that Influence Human Behavior

sociology has contributed to the discipline's tendency to ignore the biophysical environment. This tradition, inherited from Weber and elaborated by Mead, Cooley, Thomas, and others, emphasizes the importance of understanding the ways individuals "define" their situations, especially when trying to explain their actions (Ritzer, 1975: 27-28). As Choldin (1978: 353) has noted, because this perspective assumes "that the reality of a situation is in the definition attached to it by the participating actors [it] implies that the physical properties of the situation may be ignored." This can be done because an actor's "definition of the situation" is assumed to be influenced by surrounding actors rather than by the situation's physical characteristics; indeed, from this perspective physical properties become relevant *only* if they are perceived and defined as such by the actors. The strength of this "social definition" perspective, which complements the

Durkheimian tradition in leading sociologists to ignore the biophysical environment, has been noted by Klausner (1971: 38): "The current tradition in sociology is to treat the environment—part of the situation of action—in terms of the meaning it has to the participants in the action rather than to some objective observer."

As a result of these historical developments within sociology, the term "environment" is typically used by sociologists to mean something quite unlike what it means in most other disciplines and in public discourse. In nonsociological parlance "the environment" means our physical surroundings—the biosphere, or a local portion of it. In contrast, within mainstream sociology "the environment" is used to refer to social and cultural influences on the entity being examined (see, e.g., Catton and Dunlap, 1978a: 44; Choldin, 1978: 353; Dunlap and Catton, 1979a: 244-245). An individual's environment, for example, is likely to be viewed as comprising the groups to which one belongs, the institutions (economic, educational, religious) in which one participates, and the community in which one resides. Similarly, the environment of a community is likely to be conceptualized as the surrounding communities with which it interacts or the larger culture in which it is located. For sociologists, "environment" seldom denotes the physical properties of the settings in which individuals participate, or the characteristics of the biophysical region (topography, natural resources, climate, and so forth) in which communities are located.

This habit of terminology, and the disciplinary traditions behind it, imposed a set of "conceptual blinders" which made it difficult for sociologists to recognize the importance of the ecological problems that began to receive considerable public attention in our society in the late 1960s (Catton and Dunlap, 1978a: 44).

THE HUMAN EXEMPTIONALISM PARADIGM (HEP)

Given the unecological character of the dominant Western culture within which sociology developed, and the disciplinary

traditions just described, it is understandable that the work of sociologists has come to rest on a profoundly unecological foundation. This foundation is largely implicit and often unconscious, and consists of what Gouldner (1970: 29-35) calls "background assumptions." While seldom made explicit, such assumptions influence the way in which sociologists approach their subject matter and practice their craft. Accordingly, to understand the discipline of sociology it is important to identify these "deepest assumptions about man and society" (Gouldner, 1970: 28).

Gouldner's analysis of the nature and role of background assumptions is quite similar to Kuhn's (1962) analysis of "paradigms," suggesting to us that a set of such assumptions can be viewed as constituting a paradigm. Although Kuhn used "paradigm" in a variety of ways, Ritzer (1975) has argued persuasively that the concept is most fertile when given a broad meaning. Specifically, Ritzer (1975: 7) offers the following comprehensive definition:

> A paradigm is a fundamental image of the subject matter within a science. It serves to define what should be studied, what questions should be asked, how they should be asked, and what rules should be followed in interpreting the answers obtained. The paradigm is the broadest unit of consensus within a science and serves to differentiate one scientific community *(or subcommunity)* from another. It subsumes, defines, and interrelates the exemplars, theories, and methods and instruments that exist within it.

Using this broad definition allows one to avoid the error of equating paradigms with specific theories or theoretical persuasions. This is a common practice within sociology (see, e.g., Effrat, 1972); yet, if one simply applies the label "paradigm" to theories such as "functionalism," "Marxism," or "symbolic interactionism," little has been achieved toward understanding the intellectual impact of unstated assumptions on the field of sociology.

A few sociologists have therefore used "paradigm" in the broader and more fruitful sense. Ritzer (1975), in particular, has argued that most sociological theories can be seen as stemming

from one of three broad paradigms within the discipline: (1) the "social facts" paradigm derived from Durkheim, (2) the "social definition" paradigm derived from Weber, and (3) a newer (and, so far, less influential) "social behavior" paradigm derived from the behavioral psychologist Skinner. While we find Ritzer's analysis insightful, and feel it has considerable validity, we take him at his word when he warns that one should not "reify" paradigms. In other words, we do not take paradigms to be "real things," but "handy constructs for understanding the nature of sociology or any other field" (Ritzer, 1975: 200).

Thus, just as Ritzer was able to perceive three basic paradigms underlying the far greater diversity of theoretical persuasions seen in sociology by others (e.g., Effrat, 1972), it is possible that a still more fundamental paradigm can be discerned underlying his three.

It is our position that the vast majority of sociologists share a common (but increasingly obsolete) "fundamental image of the subject matter" of their discipline.[2] This shared image or paradigm can best be described by listing a set of background assumptions which, taken together, seem to comprise the "common core of agreement" existing among sociologists—a core that was alluded to, but not specified, by Ritzer (1975: 32, 191, 211). It must be emphasized that these assumptions are so taken for granted that they are virtually never made explicit; yet, they clearly influence the practice of sociology. Inherited from the Dominant Western Worldview (DWW) and from sociology's particular disciplinary traditions, these background assumptions can be stated (admittedly somewhat arbitrarily)[3] as follows:

(1) Humans have a cultural heritage in addition to (and distinct from) their genetic inheritance, and thus are quite unlike all other animal species.
(2) Social and cultural factors (including technology) are the major determinants of human affairs.
(3) Social and cultural environments are the crucial context for human affairs, and the biophysical environment is largely irrelevant.

(4) Culture is cumulative; thus technological and social progress can continue indefinitely, making all social problems ultimately soluble.

Like the tenets of the DWW, of which these assumptions are sophisticated variants, they constitute a paradigm that is anthropocentric, optimistic, and profoundly unecological.

The image of human societies conveyed by these assumptions is one that emphasizes the "exceptional" nature of our species stemming from our cultural heritage, including language, social organization, and technology. For that reason we labeled an earlier (and slightly different) listing of them the "Human Exceptionalism Paradigm" (Catton and Dunlap, 1978a: 42-43). However, we hardly wish to deny that *Homo sapiens* is an "exceptional" species. What we do deny is the belief that sociologists can still afford to suppose that the exceptional characteristics of our species *exempt* us from ecological principles and from environmental influences and constraints. Thus, since the foregoing assumptions imply such exemption, we have come to call the Human Exceptionalism Paradigm the "Human Exemptionalism Paradigm" (Dunlap and Catton, 1979a: 250).

In short, we are arguing that the discipline of sociology is premised on a set of background assumptions or a paradigm that has led sociologists—regardless of their particular theoretical persuasion—to treat human societies *as if* they were exempt from ecological constraints.[4] As part of their emphasis on the exceptional characteristics of humans, most sociologists have totally ignored the biophysical environment, as if human societies somehow no longer depend on it for their physical existence and for the means of pursuing the goals they value. These tendencies, in turn, have predisposed sociologists to accept the optimism inherent in the DWW by implicitly assuming the possibility of endless social progress.

In sociology's drive to establish its own disciplinary identity, especially its autonomy from biology, this underlying paradigm was useful. Moreover, the fact that sociology largely developed

when the Western world was generally experiencing an age of abundance (as previously noted) makes the discipline's tendency to ignore ecological constraints understandable, although it is surprising that so few sociologists followed the lead provided by historians such as Webb (1952) and Potter (1954) in analyzing the social implications of ecological abundance (for an exception see Williams, 1970: Chap. 2). Also, as human societies became more urbanized and technologically sophisticated, such societies—the subject matter of most sociology—appeared further removed from the biophysical environment and seemingly able to alter that environment to suit their needs (Landis, 1949: 118). Given these conditions, it is not surprising that the vast majority of sociologists ignored the biophysical environment and felt secure working within the (unseen) confines of the HEP.

Although an occasional sociologist wrote something that challenged the HEP (see, e.g., LaPiere, 1965: Chap. 7, and the works discussed in Dunlap and Catton, 1979a: 245), the consensus regarding sociology's unseen paradigm was so great that such departures from it could be safely ignored by the larger discipline. Twentieth-century sociology—despite its great theoretical diversity—might almost be described as having been largely devoted to "fleshing out" the HEP.

However, Gouldner (1970: 34) notes that "old background assumptions may come to operate in new conditions . . . and thus . . . become boundaries which confine and inhibit" a discipline. Our contention is that in recent years human societies have begun to experience such "changed conditions," but that sociological adherence to the HEP has made it difficult for most members of the discipline to perceive the nature of these changes. For Gouldner, the rising levels of social conflict in the 1960s signaled the demise of the once-dominant functionalist theoretical perspective (with its "consensual" image of society); similarly, we see the changed ecological circumstances of human society—signaled by rising levels of pollution, resource scarcity, and other ecological problems—as necessitating rejection of the HEP and the DWW.

FROM EXUBERANCE TO POST-EXUBERANCE

In the past few centuries the size and scale of human societies (i.e., their technological and organizational complexity as well as their actual population) tended to increase *exponentially* (Lenski and Lenski, 1978: 81-82, 97-98, 290-297). A major component of this dramatic growth involved expansion of European peoples into abundant new niches made available by two interrelated historic developments: (1) discovery of a second hemisphere that could be colonized (Webb, 1952), and (2) invention of technologies giving humans access to such "new" resources as fossil fuels (Catton, 1980: Chap. 3). Some 400-years experience with this "age of exuberance" nurtured the illusion that accelerating or exponential growth was an endless possibility (see, e.g., Hart, 1959), but events of recent years now indicate that the trajectory of human history may be portrayed more appropriately by the logistic curve shown in Figure 2 than by an exponential growth curve (Ophuls, 1977; Miles, 1976).

Current awareness of the temporariness of exponential growth was no doubt stimulated by publication of *The Limits to Growth* (Meadows et al., 1972), although at least as far back as Malthus a few dissenters had seriously questioned the possibility of continuing exponential growth (Luten, 1978). In the 1970s there occurred, as part of rising awareness of ecological constraints, a dramatic revision in attitudes toward growth. A wide range of writers—including both those who were optimistic about the future (e.g., Kahn et al., 1976) as well as some who were more apprehensive about it (e.g., Ophuls, 1977)—argued that the era of exponential growth was past (also see Brown, 1978; Miles, 1976; Renshaw, 1976; Wilson, 1977). In other words, the accelerating progress taken for granted until recently is now seen as having ended with the passing of the inflection point shown in Figure 2. While the trajectory of human history is still generally assumed to slope upward, there is growing acknowledgment that the *rate of increase* is declining—with the implication that the curve will ultimately level off.[5]

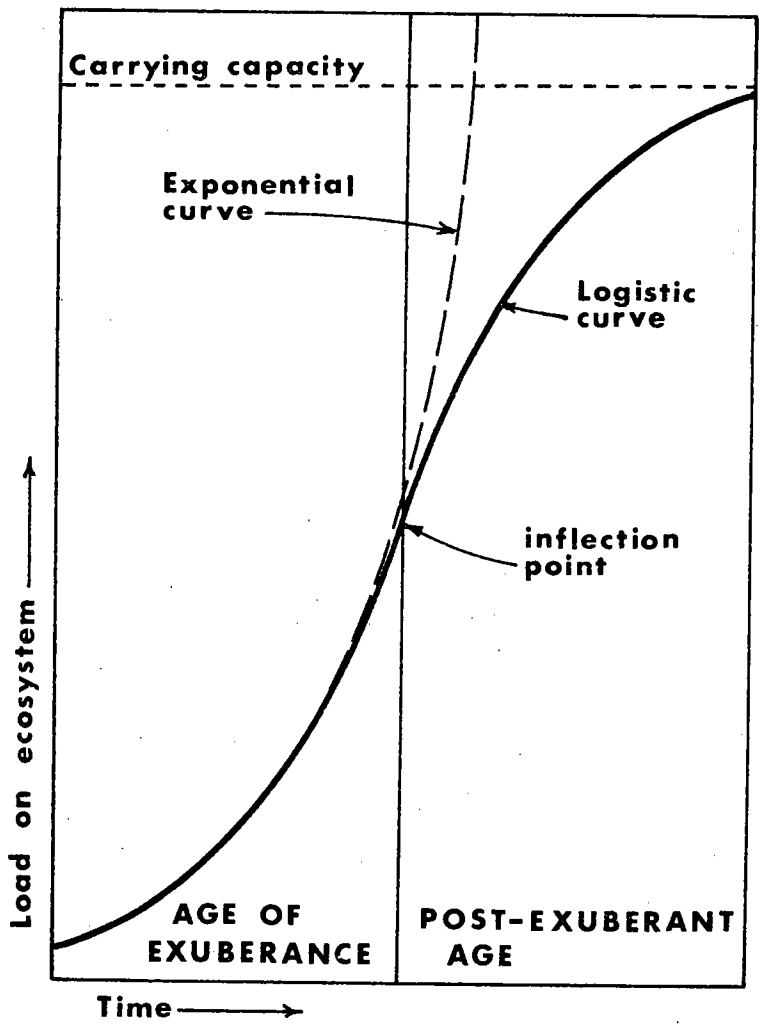

Figure 2: Exponential and Logistic Growth Models

Observers have cited a variety of evidence indicating that growth no longer follows an exponential pattern, not only for the human population per se (both in the United States and the entire world), but for virtually all aspects of human society. Thus, Renshaw (1976: 7-8, 30-35, 68-75), invoking a "law of diminishing returns," has called attention to notable declines in the rate of scientific and technological developments (such as increments in the speed of transportation), and especially in their implementation (also see Miles, 1976: 14-15). Likewise, several writers have noted that the rate of increase in food production and the discovery of natural resources (especially fossil fuels) has declined significantly in recent years (Ophuls, 1977: Chap. 2; Brown, 1978). Perhaps most noticeable of all, economic growth has begun to slow, not only among industrialized nations but throughout most of the world (Brown, 1978: 188-191; Pirages, 1978: 223-247; Renshaw, 1976).

In the United States, the slowdown in growth of GNP has been attributed to declining rates of growth in capital, work force, and particularly labor productivity (Brown, 1978: Chap. 7; Renshaw, 1976; Wilson, 1977: 148-150). Declining growth in productivity, in turn, is ultimately related to the rising cost of energy—for the latter is leading to a much slower rate of substitution of mechanical for human energy (Renshaw, 1976: 14, 28-41). And of course the dramatic rise in the cost of energy, which contributes to inflation and is diverting huge amounts of capital away from other sectors of the economy, is due to the ineluctable fact that petroleum is being depleted. Indeed, there is ample evidence that despite the economic incentives now fostering record amounts of exploratory drilling, the amount of additional oil and natural gas being discovered in the United States remains less than the amount being extracted and used (Van Slambrouck, 1980). This is, of course, a strong indication that energy from fossil fuels, the cornerstone of industrialism (Miles, 1976: 29-30, 104-107), will be decreasingly available in the future.

If one is to describe the "post-exuberant" age into which humanity has entered after passing the inflection point, the concept of "ecological scarcity" seems most apt (see the excellent

explication of this concept by Ophuls, 1977: Chap. 3). Unlike "simple Malthusian scarcity" of a single resource such as food, ecological scarcity refers to the "ensemble of separate but interacting limits and constraints on human action" (Ophuls, 1977: 9). An understanding of this concept is extremely useful for comprehending the present human situation.

Ecological scarcity is a concept that allows one to see, for example, how efforts to maintain rapidly growing use of diminishing natural resources by turning from one substitute to another must ultimately fail. Resource substitution almost invariably increases the amount of energy needed to make things or do things (LaPiere, 1965: 227-228; Ophuls, 1977: 61, 69-70), and energy availability in escalating or even current amounts has become problematic. We have begun trying to solve energy problems by substituting one fossil fuel for another, but vast increases in the use of coal as a substitute for scarce oil threaten humanity with increasingly severe air pollution, acid rain, and ultimately the possibility of changing the earth's temperature with potentially disastrous implications (Ehrlich and Ehrlich, 1972: 233-242; Stobaugh and Yergin, 1979: Chap. 4; Likens et al., 1979; Brown, 1978: 61-65). Even the use of nuclear energy, assuming safety and cost problems of nuclear plants can be overcome, threatens humanity with accumulations of toxic wastes that cannot presently be stored in permanently safe fashion (Stobaugh and Yergin, 1979: 127-135).

Moreover, even if resource substitution could continue indefinitely and make it possible to go on increasing our rates of energy use, it would be necessary to face the fact that using energy results invariably in production of heat. Given that the second law of thermodynamics cannot be repealed and given the present scale of human activity, the production of heat can no longer be ignored—for the environmental warming resulting from increased energy use will insidiously affect climate and other aspects of the global ecosystem (Ophuls, 1977: 107-111; Ehrlich and Ehrlich, 1972: 61-63).

In short, the concept of ecological scarcity rests on a realization that the global ecosystem is finite and that it is subject to

ecological laws which humans cannot permanently evade. Such "ecological facts of life" enable us to understand the importance of our recent passage into a "post-exuberant age," and to realize that the future of human society in such an age will likely differ markedly from expectations developed in the temporary age of exuberance. Successful adaptation to the changed situations can be seriously impeded by archaic worldviews and obsolete scientific paradigms. Fortunately, there is evidence that at least some members of the public are beginning to sense that their traditional view of the world, and consequent expectations about it, are no longer valid (e.g., Dunlap and Van Liere, 1978; Yankelovich and Lefkowitz, 1980). Likewise, we see evidence that some members of our discipline have begun to recognize that sociologists must also revise their disciplinary premises. We therefore turn to a discussion of the emergence of an alternative to the Human Exemptionalism Paradigm within sociology.

THE NEW ECOLOGICAL PARADIGM

The foregoing changes in the ecological context of human societies call into question sociologists' long-held habits of thought. It was, however, a sociologist who long ago noted that a disturbance of habit evokes the response called "paying attention" (Thomas, 1909: 17). The function of attention, he said, is to establish new habits adequate to new circumstances. Or, as Kuhn (1962: 76) put it in regard to scientific paradigms faced with accumulated anomalies, "The significance of crises is the indication they provide that an occasion for retooling has arrived." The societal implications of the "ecological crisis" which became so apparent in the 1970s led some sociologists to pay attention to environmental issues and to begin a process of conceptual retooling.

The "disciplinary blinders" imposed by the HEP at first largely confined such attention to applications of traditional sociological perspectives to environmental problems. There were studies of public attitudes toward environmental issues, studies of member-

ships in environmental organizations, studies of problems faced by resource management agencies, and so forth. We have called such work the "sociology of environmental issues" (Dunlap and Catton, 1979a: 246-249). At the same time, however, a few sociologists (e.g., Burch, 1971; Michelson, 1970) were beginning to focus on a topic traditionally ignored in sociology: the relationship between human society and the biophysical environment. Specifically, such writers focused attention on the interaction between humans and the biophysical environment; or the impacts of human societies on the environment *and* the impact of the environment (ranging from "built" to "natural") on social organization and human behavior.

Growth of this work through the 1970s led to the recent emergence of a true "environmental sociology" (for an extensive review of this field see Dunlap and Catton, 1979a). The distinguishing feature of environmental sociology is the willingness of its practitioners to examine relationships between social and environmental variables (such as characteristics of buildings, levels of pollution, and rates of energy use), thus violating the traditional taboo against including nonsocial variables in sociological analyses. By their acceptance of environmental variables as relevant for understanding human behavior and social organization, all environmental sociologists at least implicitly (and often unknowingly) challenge the HEP (particularly the second and third assumptions in our listing).

As the 1970s brought unmistakable evidence of the unprecedented impact (both locally and globally) of human societies on the ecosystem, and particularly of the vulnerability of humans to the ecosystem's *reaction,* some environmental sociologists went beyond tacit denial of the HEP. Apparently sensing the increased salience of ecological constraints (particularly as embodied in the concept of "ecological scarcity") for human societies in a post-exuberant age, they began to write things that contained the seeds of an alternative to the HEP (see, e.g., Burch, 1976; Buttel, 1976: 307; Catton, 1972; Dunlap and Van Liere, 1978; Morrison, 1976: 300-301; Schnaiberg, 1975).[6]

While any effort to describe a new paradigm in a few short sentences will undoubtedly be less than adequate, we think the core of this "New Ecological Paradigm" (NEP) is embodied in the set of background assumptions ~~limited~~ listed in the third column of Table 1 (in which the assumptions constituting the DWW and HEP are repeated to facilitate comparison with the NEP).[7] There are points in common between the NEP and HEP, but there are also significant differences between them. First, the NEP grants that humans are an exceptional species, but stresses that they should nonetheless be viewed as one among many interdependent species (depending on many other species for food, and competing for food, space, water, and so on with other species). Second, while acknowledging that human affairs ~~were~~ are heavily influenced by social and cultural forces, the NEP stresses that human social life is also influenced by the biophysical environment, often as a reaction to human action (in the form, for example, of buildings, pollution, and climate). Third, whereas the HEP ignores the biophysical context of human activity, and stresses the determinative influence of the social-cultural "environment," the NEP calls attention to the constraints on human affairs posed by their biophysical context (e.g., human health and physical survival are possible only under certain environmental conditions). Finally, the HEP (especially when set in the context of the DWW) implies limitlessness, and expects social and technological developments to lead to perpetual progress. In contrast, the NEP recognizes that no matter how inventive humans may be, their science and technology cannot repeal ecological principles such as the laws of thermodynamics; thus there are ultimate limits to the growth of human societies.

In sum, the "fundamental image" of human societies provided by the NEP is importantly different from that provided by the HEP. In sharp contrast to the anthropocentric HEP, the NEP stresses the ecosystem-dependence of human societies. The NEP thus clearly points to the importance of considering societies' biophysical context. And, perhaps most fundamentally, it emphasizes the fact that despite their possession of exceptional

TABLE 1
A Comparison of Major Assumptions in the Dominant Western Worldview, Sociology's Human Exemptionalism Paradigm, and the Proposed New Ecological Paradigm

		Dominant Western Worldview (DWW)	Human Exemptionalism Paradigm (HEP)	New Ecological Paradigm (NEP)
Assumptions about the nature of human beings:	DWW_1	People are fundamentally different from all other creatures on Earth, over which they have dominion.	HEP_1 Humans have a cultural heritage in addition to (and distinct from) their genetic inheritance, and thus are quite unlike all other animal species.	NEP_1 While humans have exceptional characteristics (culture, technology, etc.), they remain one among many species that are interdependently involved in the global ecosystem.
Assumptions about social causation:	DWW_2	People are masters of their destiny; they can choose their goals and learn to do whatever is necessary to achieve them.	HEP_2 Social and cultural factors (including technology) are the major determinants of human affairs.	NEP_2 Human affairs are influenced not only by social and cultural factors, but also by intricate linkages of cause, effect, and feedback in the web of nature; thus purposive human actions have many unintended consequences.
Assumptions about the context of human society:	DWW_3	The world is vast, and thus provides unlimited opportunities for humans.	HEP_3 Social and cultural environments are the crucial context for human affairs, and the biophysical environment is largely irrelevant.	NEP_3 Humans live in and are dependent upon a finite biophysical environment which imposes potent physical and biological restraints on human affairs.
Assumptions about constraints on human society:	DWW_4	The history of humanity is one of progress; for every problem there is a solution, and thus progress need never cease.	HEP_4 Culture is cumulative; thus technological and social progress can continue indefinitely, making all social problems ultimately soluble.	NEP_4 Although the inventiveness of humans and the powers derived therefrom may seem for a while to extend carrying capacity limits, ecological laws cannot be repealed.

characteristics, human beings are not exempt from ecological constraints.

To us, therefore, a shift from the HEP to the NEP is of "paradigmatic" proportions. As Gouldner (1970: 34) notes, "The most basic changes in any science [are] those that embody new background assumptions. They are thus changes in the way the world is seen." We contend that NEP-oriented sociologists do, in fact, "see the world" differently than do their HEP-oriented colleagues.

A true paradigm shift, of course, entails more than a shift in scientists' perceptions; it leads to differences in the way they practice their craft (Kuhn, 1962; Ritzer, 1975). Although the NEP is still in its infancy, we can see several ways it affects the work of its adherents. Most obvious, of course, is the fact that they violate the traditional sociological practice of excluding from consideration all nonsocial variables. For an NEP-adherent, a social fact such as socioeconomic status may be related in important ways to such *socially significant* facts as exposure to pollution (Burch, 1976) and vulnerability to negative impacts of petroleum shortages (Schnaiberg, 1975). Similarly, sociologists not blinded by the HEP realize the importance of investigating the interrelations between energy availability, for example, and social variables such as family privacy and housing patterns (Mulligan, 1976), the scale and form of urban life (Van Til, 1979), and lifestyle in general (Klausner, 1975). The NEP thus sensitizes sociologists to the probable societal impacts of "nonsocial" phenomena.

In addition, the NEP provides a basis for shedding new light on traditional sociological concerns. For example, sociology has long been concerned with various forms of competition (which sometimes escalates into conflict) between differing segments of society. NEP sociologists have begun to point to the likelihood that such competition and conflict will be heightened in an era of ecological scarcity. Thus, Schnaiberg (1975) and Morrison (1976) have suggested that energy scarcity will result in increased competition, and possible conflict, between social classes, Mulligan (1978) notes emerging conflict among regions of the United States over their differential access to energy supplies, and Catton

(1980: Chap. 13) points out ecological pressures toward scapegoating and even genocide.

Perhaps most importantly, the NEP leads to a concern with issues that are ignored in traditional sociological circles. For example, sociological attention to competition has heretofore been confined to competitive relations between two or more "current" factions (or, in the case of historical analyses, past factions contemporaneous with each other). That is, HEP sociology has limited itself to studying various forms of "synchronic" competition—even when it has examined age-based conflict such as that between youth and adults. In a post-exuberant era, however, another form of competition becomes important—the competition *between present and future generations* for limited resources and other aspects of a finite ecosystem. This "diachronic competition" (Catton and Dunlap, 1978b: 258) is likely to become increasingly intense (Catton, 1980: Chap. 1) and will no doubt make questions of "equity" even more difficult to resolve in future decades than is the case now. We anticipate some shift of sociological attention, therefore, to problems of "intertemporal equity," a topic already under analysis in other disciplines (see, e.g., Lippit and Hamada, 1977).

The long-term perspective on human societies inherent in consideration of diachronic competition and intertemporal equity is also essential to consideration of the concept of the "steady-state" or "sustainable society." Such a society would be one that provides for successful human adaptation to a finite (and vulnerable) ecosystem on a long-term, sustainable basis. Although the characteristics of a sustainable society and the means for achieving it have received considerable attention outside sociology (e.g., Daly, 1977; Pirages, 1977), it has thus far received too little attention from sociologists (Anderson [1976] is an exception). However, the nature of such a society, particularly the forms of social organization most compatible with ecosystem maintenance, and the means for achieving those forms, certainly fall within the bailiwick of sociology (Dunlap and Catton, 1979a: 266; 1979b: 81). In dealing with this topic, scholars in any discipline should find useful a number of concepts that have been refined over

several decades by biological ecologists; the "climax community," for example, is for the ecologist what the sustainable society is for social scientists (see, e.g., Odum, 1975: 10-11, 19-21, 152-154; compare Ophuls, 1977: 229, 232, 234).

THE HEP-NEP DISTINCTION VERSUS TRADITIONAL CLEAVAGES

Attempts to promote new paradigms are likely to evoke criticism, and our initial effort to distinguish the NEP from the HEP was no exception. Ironically, the major criticism has come from Buttel (1978), whose work contributed to the development of the NEP. While acknowledging that the HEP-NEP cleavage is real, Buttel (1978: 255) nonetheless argued that it is not as important as more traditional cleavages within sociology—most notably that between the "Order" (particularly structural-functionalist) and "Conflict" (particularly Marxist) theoretical perspectives. His criticism, which stems from prior efforts to explicate the importance of the Order-Conflict cleavage for the study of environmental issues (e.g., Buttel, 1976), is in a sense not surprising. As Ritzer (1975: 210, 226) has noted, most sociologists believe (incorrectly, in his view) that the Order-Conflict debate is the "basic split" in the discipline. (Ritzer's deemphasis of this theoretical cleavage stems from his inclination to see both as representative of the "social facts" paradigm.)

An important point is raised by Buttel's criticism; we therefore want to clarify and extend our view of the relationship between the HEP-NEP distinction and the traditional Order-Conflict cleavage. Confusion arises from the fact that some sociologists view the Order and Conflict perspectives as competing *paradigms;* others (such as Ritzer) see them simply as competing *theoretical perspectives.* (Buttel [1976, 1978] tends to use "paradigms" and "theories" interchangeably.) Regardless, it does appear that adherents of the Order and Conflict perspectives tend to see society rather differently. Thus, Order theorists view societies as relatively well-integrated and consensual, whereas

Conflict theorists tend to see them as more competitive and coercive.

We think Dahrendorf (1958: 74) has nicely captured the "background assumptions" underlying these two "models of society." He lists the following as the "implicit postulates" of the Order model:[8]

(1) Every society is a relatively persisting configuration of elements.
(2) Every society is a well-integrated configuration of elements.
(3) Every element in a society contributes to its functioning.
(4) Every society rests on the consensus of its members.

He then lists the postulates underlying the Conflict model as follows:

(1) Every society is subjected at every moment to change: social change is ubiquitous.
(2) Every society experiences at every moment social conflict: social conflict is ubiquitous.
(3) Every element in a society contributes to its change.
(4) Every society rests on constraint of some of its members by others.

To us, the striking feature of these two "competing" models of society is that they *both* are solidly within the HEP tradition and totally neglect the ecosystem-dependence of human societal life! It is therefore not surprising that the vast majority of sociologists working with either of these models have failed to take note of humanity's changed ecological condition.

Nevertheless, as Buttel (1978: 254) notes, one can detect Order-Conflict differences among environmental sociologists whose work reflects, in varying degrees, the NEP. This is certainly understandable, as we would not expect these scholars to have shed immediately or completely their allegiance to traditional sociological theories or paradigms when they began their NEP work. Thus, while neither the Order nor the Conflict perspective has traditionally had anything to say about the ecological base of human societies, individuals schooled in one of these perspectives would naturally tend to bring it to bear on their own

NEP-oriented work. One finds, for example, Schnaiberg's *The Environment: From Surplus to Scarcity* (1980) solidly in the Conflict camp, whereas Burch's *Daydreams and Nightmares* (1971) is more akin to the Order tradition. Likewise Anderson's *The Sociology of Survival* (1976) is generally Marxist in orientation, while Klausner's *On Man in His Environment* (1971) is strongly functionalist.[9]

What these few examples suggest is that the Order-Conflict cleavage (and in all likelihood other traditional theoretical cleavages in sociology) cross-cuts the HEP-NEP cleavage, resulting in new and rather complex paradigmatic/theoretical orientations among sociologists, as shown in Figure 3.

To illustrate the usefulness of this schema, we turn to recent work by four eminent sociologists (none of whom is regarded as an "environmental sociologist") on the probable societal impacts of ecological scarcity—particularly the impacts on the stratification system. Two of the writers, Lipset (1979) and Smelser (1979), are prominent representatives of the Order perspective, while the other two, Rainwater (1977) and Horowitz (1977), are prominent among Conflict sociologists. Despite these differences in orientation, all four writers provide quite similar analyses of the likely effects of increasing scarcity (and resultant slowed growth) on our nation's stratification system—less mobility, regressive distribution of impacts, and increased social conflict (which will strain our democratic political system).

Nonetheless, there are some interesting differences among the four. As one might expect, Rainwater and Horowitz (the two conflict theorists) indicate a strong concern with the achievement of greater equality via redistribution, so that the burden of scarcity will be less disastrous for those at the bottom. On the other hand, one can detect a slightly keener concern on the part of the two order theorists, Lipset and Smelser, for maintaining a democratic political system (although Horowitz is also quite concerned about this). At the same time, however, there are sharp differences *within* each of these two pairs, concerning the *reality* of ecological limits. This leads us to classify one member of each pair of works into the HEP row, and one of each into the NEP row.

	Order theory	Conflict theory
Human Exemptionalism Paradigm	HEP-order	HEP-conflict
New Ecological Paradigm	NEP-order	NEP-conflict

Figure 3: A Cross-Classification of Cleavages

Thus, Lipset's analysis seems to fall into the HEP-order cell. Although he acknowledges that his belief in the possibility of continued growth is a "hope" (Lipset, 1979: 24), overall he takes a very skeptical attitude toward the idea of ecological limits, implies that a slackening of growth will result more from policy options than from ecological limits, and concludes with a classic HEP position: Since a purposeful reduction in growth will undoubtedly have negative impacts, we should opt for continued growth because

> the assumption that necessity is the mother of invention, that demand will provide the impetus for new discovery in the future as in the past . . . offers a more beneficent prospect for the future of both the developed and underdeveloped worlds [Lipset, 1979: 34].

In sharp contrast, Smelser's somber analysis, which we would place in the NEP-order cell, is premised on a very NEPish proposition:

> In the foreseeable future humanity will always be pressing against one limit or another—if it is not oil, it may be some metal in short supply and difficult to substitute for or synthesize; or it may be certain classes of foodstuffs. It is very difficult not to envision the future as a constant series of crises and diversions of resources to overcome these crises [Smelser, 1979: 222].

Analogously, Rainwater's otherwise insightful analysis of the need for substantial equality in a sustainable society HEPishly prescribes greater equality *first,* and *then* slowed growth (as if the latter were primarily a matter of choice). For this reason we would place it in the HEP-conflict cell. Appearing to doubt the reality of ecological limits, it also alludes to the future in a way that makes diachronic competition almost unrecognizable: "It would be shameful if the exigencies of saving the planet for the future of mankind became an excuse to perpetuate the injustices some men now inflict on their fellows" (Rainwater, 1977: 273).[10] In contrast, Horowitz's more realistic assessment of ecological limits leads him to the politically unpalatable conclusion that the United States must begin to accept a "revolution of falling expectations" (Horowitz, 1977: 12, 15) in order to cope with a future of increased scarcity, thus clearly qualifying for the NEP-conflict cell.

In sum, despite their differing theoretical orientations, Smelser and Horowitz share a view that departs markedly from the HEP; both believe human societies will have to change in fundamental ways to cope with ecological limits. In contrast, Lipset and Rainwater, who also perceive the negative impacts of scarcity, ultimately fall back on an eminently HEPish position—hoping the problems can be averted by maintenance of traditional patterns of growth.

Our point in all this is not to argue that the HEP-NEP cleavage supersedes traditional cleavages, but to demonstrate that it is *just as real*—and, in some instances at least, it may be more important. Thus, we anticipate that existing Conflict theories and Order theories, stemming as they both do from the traditional HEP, will undergo significant modification as their adherents attempt to ground them more explicitly within the NEP (see, e.g., Enzensberger [1974] for an attempt to reconcile Marxism with the ecological constraints acknowledged by the NEP). This, of course, raises the question of whether, for example, NEP-

Marxism will have more in common with traditional HEP-Marxism, or with other NEP theoretical perspectives. Only time will tell. No paradigm is so specific that it automatically generates a full-blown theory. It only makes certain kinds of questions askable and certain kinds of hypotheses conceivable (Catton and Dunlap, 1978b).

CONCLUSION: THE PROBABLE FUTURE OF THE PARADIGMS

New kinds of questions, and previously inconceivable hypotheses, will be required of sociologists by the ecological constraints inherent in a post-exuberant age. We expect a growing number of sociologists (and other social scientists) to feel the need for shedding the blinders imposed by the HEP. Anomalies generated by recognition of the impacts of ecological constraints on a species thought to be exempt from them will exert pressure for adoption of a more ecologically realistic worldview. Our explication of the NEP is an attempt to foster the needed realism. We are heartened by evidence of the apparent penetration of this new paradigm beyond the small but growing area of environmental sociology and into the work of at least a few eminent members (e.g., Smelser and Horowitz) of "mainstream" sociology.

It would be foolhardy, however, to predict the imminent demise of the venerable HEP; when its reign seemed unchallengeable, generations of social scientists received their professional socialization according to its tenets. The tenacity with which many of its adherents will defend its implications (in the face of troublesome facts) is well illustrated in recent work of two additional eminent sociologists. For example, in a wide-ranging critique of opposition to nuclear power, an energy source that he believes necessary for continued economic growth and prosperity, Nisbet (1979) views such opposition as a manifestation of declining "faith in progress." By implication, then, continued growth and prosperity could be guaranteed (ecological scarcity

notwithstanding) if only we could *restore that faith.* Similarly, Bell (1977: 18), in a strong defense of economic growth and a scathing attack on the idea of physical limits to growth, assures readers that, "If one thinks only in physical terms, then it is likely that one does not need to worry about ever running out of resources." This unecological view is consistent, of course, with his long-held vision of a "post-industrial society," premised as that view is on absence of ecological constraints such as resource scarcity (Marien, 1977). Bell does, however, acknowledge the possibility that there may be "social limits to growth." *If* there are limits to the development of human societies, Bell seems to be saying, they *must be social* rather than physical. This is, of course, the quintessential HEP response to the "anomalous" limits now affecting human societies.

NOTES

1. An environment's *carrying capacity* for a given form of life means the amount of that life form which that environment can continue supporting indefinitely. When carrying capacity exceeds the quantity of the life form then present in that environment, the surplus can have profound consequences, fostering either population growth or quality-of-life improvement, or both. It ought to be obvious that a carrying capacity deficit would have opposite and equally profound effects. For definitions and discussion of related concepts, see Catton (1980).

2. By very different methods (a "discursive," or linguistic/phenomenological, analysis), Lemert (1979) reaches a similar conclusion—that modern sociologists share in a "homocentric" image of man.

3. A criminologist has recently discerned a similar set of background assumptions in contemporary sociology (Jeffery, 1976: 152).

4. Even sociological human ecology, despite its historical ties to biological ecology, has come to operate within the confines of the HEP (see Dunlap and Catton, 1979b: 58-59, 62-65).

5. There is disagreement, however, over whether carrying capacity is a fixed (or even still enlargeable) quantity, or has begun to decrease from environmental degradation. For the time being we have simply sidestepped this issue; in our argument it suffices simply to show that even if carrying capacity is fixed and can be represented by a horizontal upper asymptote in the logistic model, conditions of life in post-inflection times are now increasingly recognized as differing fundamentally from pre-inflection conditions. In addition, there is disagreement—which we also sidestep here—over whether or not the

ecological load imposed upon the global ecosystem by present human numbers and existing technology *already exceeds* ecosystem carrying capacity. See, for example, Kahn et al. (1976), versus Catton (1980: Chap. 15); Ophuls (1977: 131-137).

6. For an even earlier statement—which unfortunately had little immediate discernible impact—see LaPiere (1965: Chap. 7).

7. In an earlier effort to explicate this nascent paradigm, we labeled it the "New Environmental Paradigm" because it was embodied primarily in the work of environmental sociologists (Catton and Dunlap, 1978a: 44-45). However, since the essence of the NEP is its "ecological" worldview, we have subsequently come to label it the "New Ecological Paradigm" (Dunlap and Catton, 1979a: 250).

8. Dahrendorf actually purports to describe the postulates underlying "structural-functional theory." However, since this theory is the major representative of the Order perspective, his description can also be applied to the broader perspective.

9. Unlike Buttel (1978: 254), however, we do not see Klausner's book as "solidly within the 'NEP' tradition," because of an important ambiguity: it points out the "doctrine of human exceptionalism" but fails to show the unecological inferences drawn from that doctrine.

10. We do not disagree, of course, with Rainwater's moral concern for present inequities. Rather, we feel he does not sufficiently recognize the seriousness of problems of intertemporal equity.

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