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NATURE AND HUMAN NATURE

BY

LEE M. TALBOT
NEIL H. CHEEK, JR.
RODERICK NASH

Edited by WILLIAM R. BURCH, JR.

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INTRODUCTION

The division of learning into the humanities, sciences and social sciences reflects an organizational convenience for universities. Unhappily this convenience has become our burden. We tend to perceive the world through the specialized and exclusive vision of particular academic departments. Of course, fishermen, children at play and things of the wilderness know the absurdity of so dividing the world. They know that nature is a unity whose poem includes humanity and which cannot be fully understood without the structured measures of science.

This bulletin shares the view that nature is indivisible and that we must re-discover the nature in human nature. Yet, our intent is to obtain this unity through a disciplined perspective. Therefore each author draws from his authority in a particular field—biology, sociology and history. Further each of the author's have looked well beyond the bounds of their discipline. Perhaps, Talbot's practical experience with the Smithsonian Institution and the President's Council on Environmental Quality; Cheek's experience with applying social science to National Park Service problems and Nash's business experience in running a successful outfitting firm have released them from some of the more musty concerns of their fellow scholars.

Each of the papers are tied into a general concern with the nature of human social organization. Nash explores how the wilderness shapes the social order, Cheek examines how play supports it and Talbot documents how management of world sea resources demands it. Further though each paper is a fine example of its author's respective discipline, each paper, also, contains elements of the other two perspectives. Thus in addition to the ecological factors of marine fisheries Talbot discusses social structural features which lead to overestimating the resource and underestimating the problems facing it, while he is not embarrassed by a poetic feel for the creatures of the sea and the men who hunt them. Cheek gives due attention to sociological issues yet, makes considerable use of findings by biologists and creatively reconstructs our image of play. While Nash, re-creates the poetry of wilderness, he clearly has an understanding of the ecosystem elements and the social meanings wilderness has for campers and other persons.

Dr. Talbot's paper aptly illustrates the need for a holistic approach to marine resources. He indicates the similarities and continuities between terrestrial and aquatic systems of resource management. Of particular interest is his demonstration of the real limits to our information regarding the resources of the sea. He argues that by concentrating upon only a few economic species and only using trends in catch size to develop measures of Maximum Sustainable Yield we are deceiving ourselves about the real limits of marine resources. The entire ecological web of survival upon which the commercial species of fishes depend must be considered. Indeed, the perpetuation of marine fisheries requires attention to mechanisms of social control, new forms of ecological research and new patterns of understanding among maritime nations.

Dr. Cheek points to similarities in approach and findings between biologists and social scientists. He notes that play has certain universal cross-species properties which permit fruitful interaction between disciplines without the usual concern as to which discipline owns the particular knowledge property. Cheek points out several cases where human studies could inform ethological efforts with other species and several cases where studies of other species could aid the theoretical grasp of the social sciences. He demonstrates that the study of play is essential for a full understanding of social species and is a prime research area where biologists and social scientists should cooperate.

Dr. Nash clearly illustrates how attention to a particular problem is often the best means for cross disciplinary efforts. Indeed, he nicely illustrates how wilderness can have a multiplicity of uses for a multiplicity of disciplines and social issues. He gives particular attention as to how the biologist, the social scientist and the humanist can find a common research point in the wilderness. In the best sense of the poetic imagination he establishes an independent reality to a non-human phenomenon without any loss in human meaning and dignity.

These papers were first presented as the International Champion lectures during the 1974-1975 academic year. Though the excitement of the actual presentation is missing we hope our revisions give them new life as written presentations. We view our exploration as part of the evolving new ecology which is re-uniting many of the sciences and humanities.

CHAPTER ONE

NEEDED: A REVOLUTION IN OUR MANAGEMENT OF THE LIVING RESOURCES OF THE SEAS—THE NEED TO REVISE THE SCIENTIFIC BASIS FOR MANAGEMENT OF LIVING MARINE RESOURCES

LEE M. TALBOT, PRESIDENT'S COUNCIL ON ENVIRONMENTAL QUALITY

Living Resources of the Seas may seem a long way from forestry, at least, from the tradtional interests of the traditional school of forestry. The Yale School of Forestry and Environmental Studies, however, has a tradition of not being a traditional forestry school. Its approach, as I understand it, entails more of a holistic view of environment, than a tunnel view of board feet. And in this perspective, consideration of ocean resources becomes as pertinent as consideration of terrestrial ones.

There are really two parallels here. The first involves how we *view* our resources. Obviously, environment involves aquatic as well as terrestrial ecosystems. The biosphere in which we live and on which we rely is all inclusive. Wet or dry, our resources are all components of our ecosystem.

The other parallel, however, relates to how we *manage* our resources. Foresters often have been accused of practicing narrow, tunnel vision, boardfoot forestry, focusing on lumber to the exclusion of the forest ecosystem with all its associated resources, values and interrelationships. There has been considerable effort by the forestry profession to change that situation. In the same way, our management of marine resources has largely been an approach focused on a single value. It, too, has involved a simplistic, single species management; but to a large extent, it still involves such an approach. There is a clear need for a holistic revolution in our management of the living resources of the seas, and this paper is in-

tended as a call for such a revolution. If one can generalize, our management of all resources, renewable and nonrenewable, started as a single purpose operation—resource managers focused on their particular resource, in isolation, and in a response to the particular constituency who wanted that resource, in isolation. It is only recently that the constituency—some of it—and the resource managers—some of them—have recognized that we must treat all resources as interrelated components of an ecosystem. In a sense, that is what the environmental movement of the past few years is all about.

In a larger perspective, our approach to quality of life and to environment has paralleled that of our approach to science in general. Throughout much of scientific history—and virtually all of scientific teaching—there has been a thrust to reduce a complex whole to smaller, simpler, more understandable components. In the process we have developed a greater and greater understanding of these components, but we have often failed to comprehend the whole, indeed, we may have obscured our comprehension of the whole.

If we are to achieve quality of life, we must approach this endeavor in a holistic way; we must deal with our environment from an ecological point of view, not from a narrow, fragmented one. There is a growing recognition of the interrelated nature of our global activities; the United Nations Conference on the Human Environment at Stockholm had the motto, "only one Earth." We continue to hear much about ecology in the news; scientific organizations hold symposia on ecosystems approaches; and most universities have some kind of interdisciplinary or ecosystems type of program or curriculum on the books.

Yet we are a long way from applying a holistic approach to real life.

There are several obstacles. A major one is the traditional academic system. The traditional university is composed of departments based on traditional academic disciplines or specialties. Academically and administratively, these compartments are virtually water-tight. The system of academic awards and advancement is based on this fragmented foundation.

As I noted above, many universities have interdisciplinary curricula or programs on the books, but underneath the new name,

the traditional product remains the same. If a student wishes to take a more holistic approach, he is likely to be told that it is not "scientific"; not "adequately academic"; that the traditional specialities are "where the action is"; that after he specializes there will be plenty of time for him to generalize—if he still wants to and has time. The result most frequently is a specialist with tunnel vision and little or no appreciation of or capability for dealing with the holistic nature of life.

One major consequence of this is that now, when the world has a greater need than ever before for effective management of its environmental resources, and when there is more lip service being paid to a holistic approach to this problem than ever before, we are in truth not much closer than we ever have been. Management continues on a fragmented, single factor basis.

Nowhere is this better illustrated than with our management of the living resources of the seas.

The world's increasing human population places ever-increasing demands upon its food resources. The world population is now 4 billion. If the population continues to increase at today's rate, over the lifetime of today's young people we will have 12 billion more—from 4 to 16 billion in one lifetime! Even with the most optimistic projections of success in limiting population growth, the forthcoming increase in the numbers of mouths to feed will be the greatest in history. Between now and the year 2000, there will be an increase of some 2 billion, over a 50 percent increase in population in the next quarter century! Yet, the world's efforts to produce food have barely kept pace without present population, and there is no assurance that this production can meet the challenge of our inexorably growing population.

There is growing international recognition of the magnitude of the problem, evidenced by the UN Environment Conference, the World Food and World Population Conferences in 1974 and the fisheries aspects of the current Law of the Sea negotiations.

Heavy emphasis—and hope—is being laid on the world's living resources of the seas to provide a major source of protein to meet these dramatically growing needs. Yet at the same time, it is clear that our past attempts at management of these resources have allowed depletion rather than assured sustained or improved yields.

Consider the world's commercial fin fishery: in 1950 about 21

million tons of fish were caught in the waters of the world. Rapidly growing fishing fleets with ever more effective fishing equipment raised the catch to 40 million tons by 1960 and to 70 million tons by 1970. Then the catch began to decline and by 1975 had dropped to 65 million tons, in spite of every increasing fishing effort and improving fishing technology. These gross figures, bad as they are, do not reflect the very severely depleted conditions of many of the component species or stocks. The world's whale populations are an archtypical example where one stock after another has been overharvested into commercial or biological extinction—to the point where all eight forms of the world's great whales are now on the U.S. Endangered Species List.

The two principal factors involved in management of any resource are the institutional arrangements for management and the scientific basis which the institutional arrangements are intended to implement. Effective institutional arrangements are essential to effective management. But the best institutions in the world cannot be effective unless the scientific basis for their management is valid. Consequently, I shall address this scientific basis.

First, it should be recognized that there has been no scientific basis for much of the worldwide harvest of marine living resources. This harvest has constituted pure exploitation or mining, rather than management of the resource in the sense that I am using it here. However, where there has been management, as such, the concept of Maximum Sustainable Yield (MSY) often has been the basis for commercial and sport harvest of living marine resources—fin fishes, marine mammals, and invertebrates. It is explicitly stated or is basic in many international agreements and treaties, and is at least implicit if not the explicit basis for local and national regulations. It has been rather uncritically accepted as established doctrine for decades by managers of these resources, by policy makers, and is basic in the approach of many nations to fishery aspects of the current Law of the Sea negotiations.

However, there is serious scientific question about the validity of the concept as it has been applied, and there appear to be no examples of its successful long-term application to a resource.

The concept has served a useful role in the evolution of fisheries management, but our knowledge has now passed beyond that point. MSY is no longer appropriate or adequate, and it is long past

the time when the world should have a better basis for management of marine resources.

It should be emphasized that I am not questioning the *generalized goal* of maximizing yields of the values of a resource on a sustained basis. My remarks are directed to the specific formulation of MSY as it has been developed and applied to management of many living marine resources.

MSY, as I am using it, is the concept of management based on a simple S-shaped population curve, applied to a single species or stock without reference to other components of the ecosystem. It assumes that there is a well established, fixed relationship between a resource stock level and annual sustainable harvest or yield. It seeks to achieve the highest annual harvest or yield, in numbers or weight, which theoretically can be sustained while maintaining the stability of that stock. Management based on MSY seeks to manipulate numbers of the population to achieve and sustain the stock size at MSY level, i.e., the stock level at which the theoretical maximum harvestable recruitment to the poulation occurs. This level often is determined from a simple, usually logistic model, based on the simple S-shaped population curve, suggested as early as 1838 (Verhulst, 1838).

The population curve (Fig. 1) is S-shaped because increments to the population are slow when the population is at a low level, with few individuals reproducing; the increments increase steeply when the population is higher and all individuals are reproducing at maximum rate; and the increments level off when the carrying capacity of the environment is reached, and mortality or other loss balances recruitment.

The MSY concept is based on the assumption that an unexploited population exists at an equilibrium density, maintained by density dependent factors—in terrestrial terms, it is at the carrying capacity. When the population is reduced and the density lowered, recruitment rates increase and exceed rates of loss. The difference between the recruitment and loss represents the number of animals which can be removed through exploitation, without reducing the population further, and if that number is removed annually, it is assumed that the population will be stabilized at a new, artificially induced equilibrium density (Fig. 2).

Under a strict, abstract logistic curve condition, the population

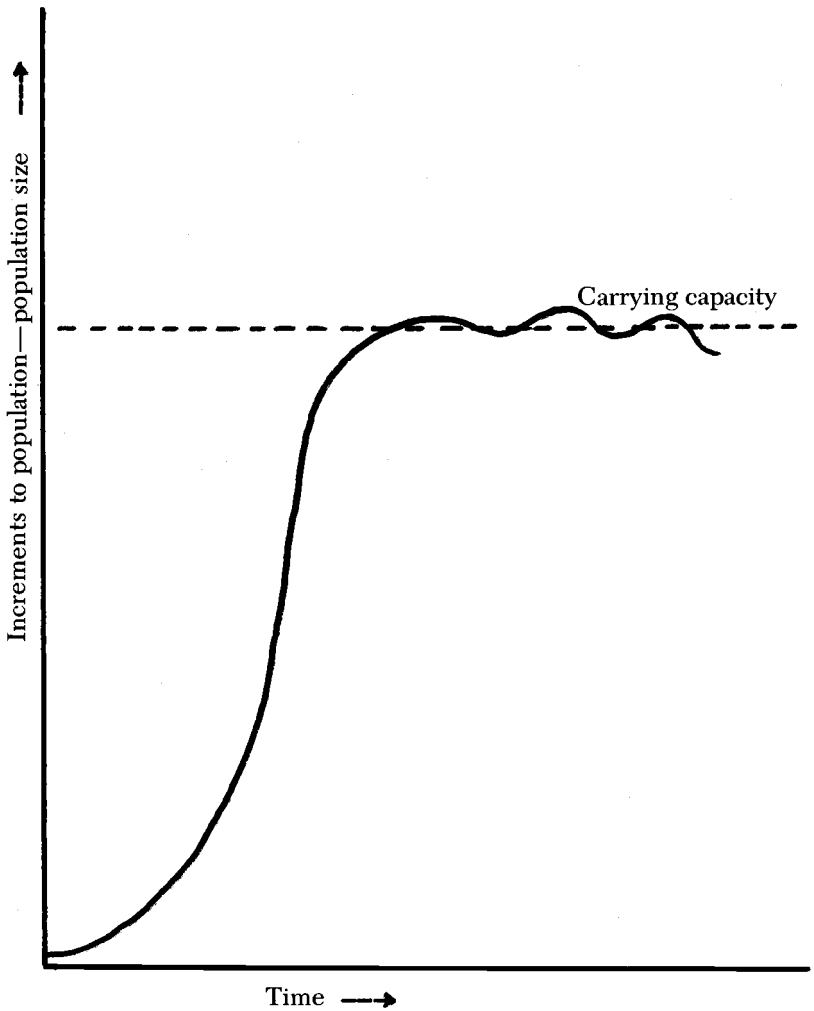
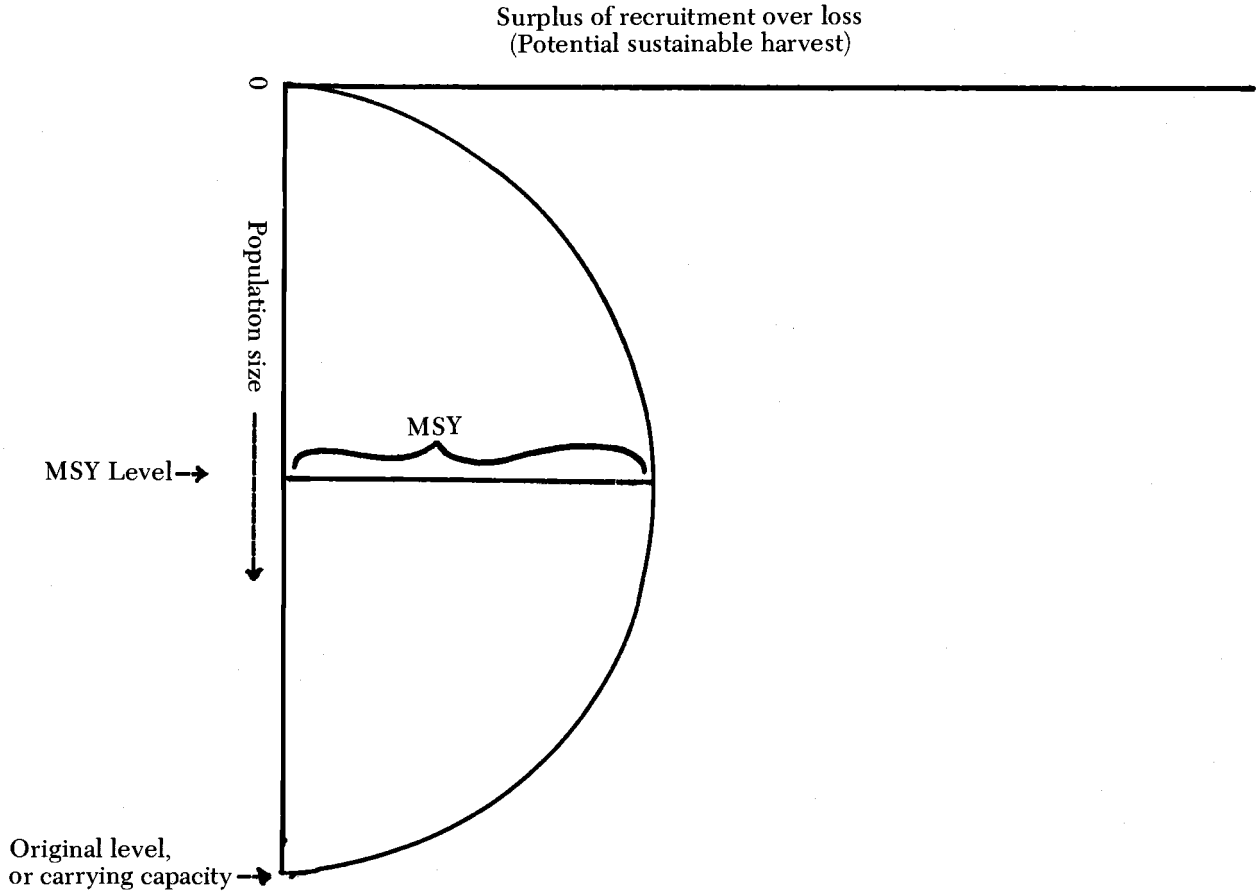

Increments to population—population size
Carrying capacity
Time

Figure 1.

Figure 2.


Surplus of recruitment over loss
(Potential sustainable harvest)
0
Population size
MSY
MSY Level
Original level,
or carrying capacity

density producing the greatest harvestable surplus—therefore the MSY level—is one-half the unexploited population density. In the real world, however, population dynamics of species do not appear generally to follow the straight line relationship, and the theoretical MSY level would range from roughly one-third to over two-thirds of the unexploited level. Consequently, because of that factor alone, MSY based on a simple logistic curve is not valid for most animal populations.

However, regardless of whether or not a logistic model is used—and some MSY models are much more complex—there are much more fundamental problems with the application of the concept. From an ecological point of view the use of MSY on the basis of a simple model applied to a single species is almost certain to fail because it does not take into account the many factors affecting or operating on the species itself, nor the interrelationships between the species harvested and the other species and elements of the ecosystem.

The factors operating on the species itself—which MSY ignores—include: 1) effects of altering the age or sex structure of the species; 2) impacts on social and behavioral organization; and 3) stochastic or cyclic changes in population level.

To illustrate with one example: MSY usually assumes a purely numerical model of a population system in which all individuals are treated as being equivalent. It usually does not make allowance for age and sex differences, nor the impact of exploitation on age and sex structure. In a population which requires several years to reach reproductive maturity, harvest usually truncates the age composition. Both random harvest, and harvest which selects for larger and therefore usually older individuals, skews the population structure leaving a higher proportion of younger, nonreproducing age classes. This, of course, lowers the potential recruitment. A heavily exploited population could at least in theory have its age structure so skewed to young age classes that the reproductive rate could drop below maintenance levels.

The MSY models do not make any allowance for impact of exploitation on behavior, including factors such as the possible reduction in reproduction caused by disruption of social structure; nor the possible effect which the loss of group leaders, experienced in foraging or migration, may have on group survival. MSY further as-

sumes stable population levels, affected only by human exploitation. Yet, it is a basic ecological principle that all population densities fluctuate to some degree, and and there are very significant stochastic or cyclical changes in many species. Lemmings are the classical terrestrial example.

The ecosystem relationships ignored by MSY include:

1) natural or induced changes in carrying capacity, such as through climate or pollution;
2) responses within a trophic level, e.g., those of competitive species;
3) responses between trophic levels, e.g., those of prey to carnivore reduction, or of carnivores to prey reduction; and
4) impacts on symbiotic or commensal relationships.

MSY only considers the effects of exploitation on an individual stock or species, in isolation, and fails to provide any basis for predicting the first or second order effects on or from other components of the ecosystem. Where several species in the same trophic level are involved, harvest of one to a theoretical MSY level may result in other species "moving into the niche" of the harvested species and fully utilizing the resources—food, space or whatever—that were formerly utilized by those removed by harvesting. This has the effect of establishing a new carrying capacity for the exploited species, at the level originally calculated as MSY level. With the stock at carrying capacity, there will be no harvestable surplus, and if harvest is continued at the originally calculated MSY rate, the population will be rapidly further depleted. Krill in Antarctic provide a specific example where several whales, seals, various fin fishes, and birds all appear to compete for the same basic resource.

This is only one example of the type of first order responses ignored by MSY. There will also be changes in more remote parts of the system as a result of first order impacts. No species exists in isolation, and effective management must take the ecological relationships into adequate account.

Effective management must also take into account the status of the data base. For most aquatic species the data are fragmentary at best, derived from catch figures and relying heavily on assumptions about population levels as well as population dynamics.

The use of catch data itself introduces a distinct set of uncertainties. Population levels are estimated in part by catch per unit effort—e.g., the catching success per day of boat effort. But boats differ. There are constant changes in the ship design, engines, fishing gear, fish locators—such as use of sonar or aircraft—and in the skill of individual crews and captains. These variations are so significant that comparison between catch per unit effort of ships in one fleet at one time may be virtually meaningless—and comparison from one year to the next, ridiculous.

A further type of error from catch statistics is lag effect, also ignored by MSY. This effect operates in populations which require some years for individuals to reach reproductive maturity. Take the example of an unexploited population which requires five years for individuals to reach sexual maturity. With fishing effort that reduces the adult population by 10 percent a year, after five years of effort the adult population will be cut by half. Yet, the young coming to maturity during this five year period represents recruitment from the original population. Catch figures will show a constant recruitment, which is interpreted to indicate a constant population level—instead of one reduced by half—and harvest quotas based on a high constant population will produce gross over-harvest.

P. A. Larkin (1972) notes that:

"We must first acknowledge that, for the most part, our theories of fisheries management are essentially based on circumstantial evidence.". . . For example, for many of our fisheries the relation between stock and recruitment 'remains obscure,' by which we mean that it is the same relation that one would observe if there were no relation. In other instances it is difficult to estimate fishing efforts because of rapidly changing fishing technologies. The consequence of harvesting mixed species continues to haunt us like a can of many kinds of worms. Even on relatively basic matters such as the genetic consequences of harvesting we are much in the dark. . . ."

He concludes:

"In brief, our fisheries literature is largely unscientific in the strict sense of the word, and our fisheries management is unscientific in almost any sense of the word."

Larkin is an established voice within the marine resource professionals. I have approached the problem from the standpoint of an

originally terrestrial population ecologist who has become deeply involved with international fisheries matters. But my experience strongly corroborates his observations. Much of what I have seen of the scientific base for marine fisheries management consists of more or less sophisticated statistical calculations applied to a fragmentary and nonrandom data base, on the basis of gross and often ecologically unjustifiable assumptions.

Yet, fisheries management appears to have had remarkably effective public relations. For the most part, policy makers here and abroad—and indeed, all too many of the managers themselves—treat it as an exact science, accept the MSY concept as gospel, and take the population figures and numerical quotas based on it as precise, established fact.

Worse, there is real danger that MSY and the management problems—indeed obstacles—that it embodies, will become set in concrete as international law through the current (1975—76) Law of the Sea negotiations. The original U.S. position defined "full utilization" of fisheries and conservation in terms of MSY. We have amended this slightly, but our negotiators in Geneva today still adhere to MSY because it is "accepted," "understood," "it is simple," and "the biologists support it."

And while there is growing recognition that an ecosystem approach really is needed, there is also considerable academic as well as bureaucratic resistance. Cushing (1974) writing about the link between science and management in fisheries stated:

"It has sometimes been stated that fish stocks could be assessed by the study of ecosystems rather than by the study of single populations. This is rubbish."

Clearly, there is not unanimity here. Equally clearly, there is a pressing need to reexamine the concepts basic to management of living marine resources in the light of current ecological knowledge and experience; and the major challenge is to develop an ecologically sound alternative to MSY. In my view, effective management of living marine resources must deal with species involved in the context of the ecosystem—and critical analysis of our present efforts will produce the following conclusions.

1. MSY is not appropriate or scientifically justifiable to serve as the sole basis for management. Indeed, no simple formula or simplistic slogan can be. 2. Any effective management must take

into account not only the species or stock involved, but also the ecosystem, and should assure that:

1) the health of the ecosystem is maintained in the sense that risks of irreversible change or long-term adverse effects are minimized.
2) a variety of present and future options should be maintained.
3) management decisions should be conservative to allow for a margin of error, likely to result from inadequate data and imperfect institutions; and
4) the privilege of exploitation of a marine living resource carries with it the responsibility and obligation to assure that data on the effects of exploitation are gathered, analyzed, and made public. Such analysis should precede exploitation of any new stock as well as accompany on-going harvest.

Rational management of living marine resources will require an approach along these lines. In view of the significance of these resources to mankind, it would be inexcusable to perpetuate an unsound management regime; yet we will simply perpetuate the mistakes of the past until we recognize the inadequacies of MSY, and we develop and apply a more suitable scientific basis for management.

CHAPTER TWO

THE ETHOLOGY OF LEISURE: SOME OBSERVATIONS ON THE SOCIAL ORGANIZATION OF SPECIES

NEIL H. CHEEK JR.
TEXAS A&M UNIVERSITY

Prefatory Remarks

I have long been interested in two complementary streams of argument about human society. One stream emerges from the biological tradition and the other from the sociological or social science tradition. Although these are often thought to be competing explanations, it seems to me they are both necessary to an adequate understanding of animal social orders, particularly those which employ culture as an adaptive mechanism. In the remarks which follow, I seek to identify this common interest of these streams of argument by examining some observations shared between them with reference to play and leisure among animals. I will try to identify common conceptual difficulties and suggest ways in which they can be resolved. Finally, I will deal with these matters in a fairly abstract manner in an attempt to stimulate our awareness of commonalities instead of languishing among particularities.

Introduction

The systematic investigation of play and leisure is varied. Contributions are found in the literature of several branches of knowledge. These include developmental psychology, primatology, comparative psychology, sociology, geography, ethnology and history. Additionally there exist observations from therapeutic recreation, physical education and kinesiology. Taken together these

materials constitute a vast array of observations mainly related to a single species - *Homo sapiens*. Yet this perhaps trite common element is almost all that provides unity among these several endeavors. Even allowing for special theoretical concerns, and hence differing conceptualizations of an phenomenon, one might expect to discover more unanimity when the object of investigation is something so apparently simple and easily discernible as the behavior we recognize as play. Although many observations are derived from the study of *Homo sapiens*, there are an increasing number based upon the behavior of other species. During the past fifteen years in particular, as the ethological literature has expanded, observations on the play characteristic of other species, many non-hominid, have become more prevalent. In fact, it has become almost *de rigueur* to include in each ethological monograph a chapter on play. Thus we now possess observations on play among lion, hyenas, wild dogs, baboons, gorillas, chimpanzees, wolves, and lemurs to name but a few. Broadly speaking these observations share in common, regardless of the species, an interest in *social* behavior as contrasted with individual behavior. Again broadly speaking, there are two intellectual streams represented in this literature. One arising in the tradition of biological science and the other in the tradition of social science. As one peruses this literature, its complementarities are as intriguing as its problematics. For regardless of species, biologically trained observers seem no less perplexed than sociologically trained investigators with respect to the conceptualization of play, though, interestingly, none of the observers seem to doubt their ability to recognize the behavior whenever it occurs. These analytical issues are worthy of attention because of their importance for clarifying existing theoretical concerns common to both traditions. Our attempt in this paper is to begin the sorting out process. It is a rudimentary effort, hence incomplete. For convenience, we will consider separately conceptual (or theoretical) and methodological issues though we recognize their inherent interconnectedness.

Conceptual Issues

Despite the apparent ease with which observers in both traditions recognize play empirically, no such conceptual assuredness

exists. Among scholars in the social science tradition the sources of uncertainty are part of the continuing and largely unresolved metaphysical issue of: what constitutes a social act? Professor Walter Wallace (1969) stated the issue well when he noted that within the social science tradition there was no unified conception of the minimally necessary attributes a phenomenon must possess to be recognized as social. He depicts the theoretical tension as being between objective and subjective criteria. Presumably, among the several theoretical orientations he identified within sociology, there exists agreement that a social act requires minimally the presence of two or more conspecifics whose joint behavior occurs only under this condition. This would appear a minimally acceptable conceptualization which is not too dissimilar from those prevalent in the biological tradition. Yet even this apparently elementary consensus is more figurative than literal for, as Wallace notes, some theoretical perspectives require that an apparently objective social act is only such, if and only if certain subjective experiences within the participating conspecifics are also co-present simultaneously. For other theoretical perspectives, the action can occur almost entirely subjectively and be considered a social act. The theoretical fragmentation in social science exists among these several perspectives, some of which recognize conceptually only objective criteria (usually behavior): others, subjective states only; and some the combination of objective and subjective criteria as minimally necessary conditions to define social behavior. One cannot help pondering how social science might be different if but the investigators were unable to talk with their subjects! This apparent advantage would seem to make the non-hominid based observers a more likely place to encounter conceptual unity. But here the issues seem confused anew by other considerations.

Within the biological tradition there exists a theoretical duality between behavior and organism. Thus the problematics of explanation lead almost uniformly to the issues of genetics and species-specific characteristics within the larger tradition of evolutionary theory. This is mirrored diversely as in the contention that ontogeny recapitulates phylogeny or in the argument that behavior evolves independently of structure or they occur simultaneously. In short, the biological tradition obscures the issue of what constitutes a social act by a lack of conceptual agreement regarding the appropriate theoretical unit for the exploration of the evolution of a

species. Some ethologists even insist upon referring social acts to presumed non-observable drive states of individuals, thus linking firmly the confusions of the biological and social science traditions. Wolfgang Wickler's (1969) recent work lays out these problematics nicely. Thus apparently the behaviorist tradition in both social and biological theorizing offer confused criteria for recognizing a social act. Yet, as noted earlier, few observers seem to have difficulty recognizing play when it occurs *in* or even *between* species. What then are the common elements which are present in these situations?

Some Common Observable Elements of Play

For the moment we will hold constant the several observations in the literature regarding specific descriptions of motor behavior used as indices of play. We begin instead by examining certain contextual elements which might be variously conceptualized as environmental or situational variables.

Professors Dolhinow and Bishop (1972) reported a summary of observations regarding play among primates. In general, they observe, play tends to be limited to the class *mammalia*. It is a universal characteristic of the class; a characteristic normally engaged in by immature rather than adult individuals, though not exclusively. It tends to occur most frequently between two or more individuals in situations in which the troop remains in one location for a period of time. Such situations are characterized by the absence of stress - psychological, physiological or environmental. In other words such situations are those perhaps best described as possessing familiarity, emotional reassurance and lack of tension or danger. After weaning, play occurs beyond the near proximity of the mother but always within a sight or sound of the social group (troop). Finally, there appear to be sex-linked differences in play "content" suggesting a possible biological basis for the behavior. Dolhinow and Bishop (1972) provide an extensive discussion of possible functions of play behavior both for the individual and the group. They note both manifest and latent consequences of the behavior. Importantly they also observe what the behavior is not - i.e. it is not the inefficient performance of gestures or other motor pat-

terns observed later in behavior. It does not appear to be a release from boredom (which they note is perhaps an artifact of captivity since it is never observed in field situations).

As one reviews the ethological literature, the succinctness of the Dolhinow and Bishop (1972) summary becomes apparent. A number of observers of a variety of different species offer observations of play which share the summarized characteristics of primates (Schallar 1972; Kruik 1972; Jollie 1966; Mech 1970). For purposes of exposition we will base our discussion on this limited set. Our purpose is to more accurately formulate the implicit questions underlying the Dolhinow and Bishop (1972) summary and hence establish a link with the larger body of extant literature.

First, if the behavioral repertoire recognized as play is limited in occurrence to mammals, are their similar occurrences of behavioral uniqueness selectively appearing in other classes as well? If so, what functional requirements are represented? What alternative behavioral patterns have been selected out which are present elsewhere analogously in the phylogenetic scale? Conceivably behavioral elements present in other classes become uniquely related in *mammalia* to facilitate extended dependency upon adults for purposes of socialization. Regardless of the particulars of specific repertoires, there might be essential shared behavioral characteristics existing for a class.

Second, play seems to be social behavior. That is, the behavioral repertoire does not occur in the absence of an appropriate conspecific. We are here referring to manifestly observable motor sequences. While play is usually observed as occurring in the presence of an appropriate conspecific this allows room for several related though possibly independent sequences, either or both of which may be play or may not. Among primates in particular, individuals are observed manipulating objects other than conspecifics. Not infrequently such actions are categorized as play. Sometimes explanations are couched in terms such as novelty, creativity and innovation. We need to specify more accurately the conditions under which such sequences occur to clarify our conception of play. For example, is the presence of another conspecific a necessary condition (perhaps as a releaser) in order for the object manipulation sequence to occur? Are two same aged conspecifics which are independently manipulating different objects in the presence of

one another, in an act of play *or* not? Or is play *only* those behavioral repertoires which appear in direct interrelated sequence to the actions of another? With respect to *Homo sapiens* the resolution of such matters are crucial, in our opinion, to the advancement of observation and understanding of play and related leisure behavior. It is our opinion that if play is "social behavior" then it refers *exclusively* to interactional sequences which occur between conspecifics and are directly observable. (At a later point, we will examine whether consequences of such sequences are conceptually similar or different).

Third, there is the question of whether play is universally limited to behavioral repertoires occuring solely among immature individuals of a species or if other age grades are involved? Dolhinow and Bishop (1972) observe that adult primates apparently seldom play yet they are unsure why this should be the case. If this is the case, it presents an interesting phenomenon. There are many documented observations, particularly from Avian species, of the emancipation of a behavioral sequence from one repertoire with additional "meanings" being acquired in others. A common example is the emancipation of "begging" from the brood-tending repertoire and its inclusion in "courtship" with quite divergent responses occurring in the latter pattern. Does the disappearance of the play repertoire mean it ceases to occur or that it occurs as elements in other behavioral sequences not yet observed? Based upon ethological observations among non-mammalian species, the complete extinction of behavioral sequences appear remote. On the other hand, this may be a particular characteristic of the class *mammalia*. It might be a necessary precursor to the appearance of culture and proto-cultures as adaptive mechanisms for certain species. Indeed the class *mammalia* is in part characterized by species (in certain orders) with increasingly more complex social organizations dependent upon individual learning abilities. Hence, paradoxically perhaps, while culture as an adaptive mechanism provides a number of advantages to a species it is simultaneously quite a precarious adaptation. For example, the consequences of a "mass die-off", as an ecosystem equilibriation seeking property, are likely to be disproportionately disruptive for the species survival. It may be that such species possess a variety of back-up mechanisms to insure survival in such periods of extreme stress. In other parlance we are

here dealing with the extent and prevalence of redundancy in a particular system. This may be a further characteristic of certain classes providing survival potentials unavailable to others. There are at least two ways such redundancy may occur. One is the availability of alternative behavioral sequences capable of accomplishing the necessary functional imperatives for the individual. A second may be the location of the behavioral sequence in a variety of interactional patterns common to a species but independent of particular individuals. One example of the latter may explain why one of the Dolhinow and Bishop (1972) observations can be made - i.e. play is most often reported as occurring between immature primates, yet it is also commonly reported between adults and immature individuals. It is apparently much less common between adults. This suggests that the co-presence of an immature conspecific may be a necessary condition for the sequence to be released, at least, for certain primate species. That which defines a sequence is what precedes and follows it "behaviorally". Hence the question of which particular behavioral elements define play is a pressing matter if additional observations crucial to increased understanding are to be forthcoming.

Lastly, there is the observation by Dolhinow and Bishop (1972) concerning the environmental factors under which play is usually observed among free-ranging primates. The larger social group or troop usually is stationary and in a "resting" phase. That is, no antagonistic elements are observable external to the group or presumably among its members. Once alarm is sounded, all play ceases. Though it is perhaps difficult to imagine situations devoid of stress, we interpret this observation as a relative one. What is interesting is the linking of relative lack of stress and also the lack of locomotion as necessary conditions for the release of play behavior among primates. Basically many mammalian species appear to be nomadic or sedentary. That is, a species tends to move within a territory remaining close to foraging locations throughout the duration of its utility or conversely they return routinely to centralized locations between foraging sequences. Apparently locational stability seems closely related to the occurrence of play behavior among primates. One wonders why this might be so? A clue may exist when we note that such repertoires apparently unfold only within the co-presence of individuals not directly involved behaviorally in

the interactive sequences occurring between the "playmates". We might note the similarity between this contextual situation and those observed among certain social rituals common to several species of finches (e.g. allopreening among pairs). A generalized sociability may itself occasionally require reinforcement and may be released only under the apparent absence of other demands. Quite obviously considerably more detailed observations are required before such an explanation can be acceptable. Yet it is worthy of note that the observation among social species of situations where apparently only generalized sociation is occurring is not unusual nor solely limited to *mammalia*.

To recapitulate, the Dolhinow and Bishop (1972) summary of several common observable elements associated with the release of play repertoires among primates provides a useful benchmark for further specifications of future observations. Before considering more broadly such matters, we want to examine some of the implicit methodological problematics facing students of play and leisure from an ethological perspective.

Some Problematics of Observation

Throughout the literature a variety of terms are used almost synonymously. Among these are pattern, sequence, element, repertoire, configuration, etc. Some scholars have attempted to give precise meaning to these concepts, yet most do not do so. It would seem necessary to develop some standardized criteria to guide observation if we are to more readily combine observations across species. In our opinion this is an important problem for the continuing development of the ethological perspective on play and leisure. Yet as previously noted methods and theory are inseparably intertwined. Moreover, the metaphysical issue of what *are* we to observe reasserts itself as we try to become analytically more precise. There are of course certain conventions which already exist in science which offer guidance.

The rule of parsimony remains paramount. One always seeks the most elementary explanation possible. Sometimes we seem to mistake the meaning of this rule and fall into the fallacy of reduc-

tionism. This is a particularly crucial problem when studying social behavior. In the study of social organization, explanation must be sought at the same level of abstraction as observations are made or else great theoretical confusion is likely to arise. In the social sciences we often observe the "explanation" of structural variations in reductionist terminology which is more appropriate to the analysis of interpersonal relations. A similar difficulty underlies the observation of play and its explanation. This, we believe, is the conception of social behavior most frequently underlying ethological observations. Generally, social behavior is conceptualized as the interactions or joint activities among individuals of the same species. Whenever explanation of the behavior is provided it is often related to certain broad categories such as brood-tending patterns or relations between sexually different individuals, etc. But are such actions as allopreening, copulation, courtship, etc. appropriate observations to be conceptualized as social? Is play at the same conceptual level or is it different? Play may be a form of behavior arising solely in social life and not derivable from other behavioral elements as I mentioned earlier. But this observation does imply a somewhat different conceptualization of social behavior. It suggests that the appropriate building blocks (i.e. units of observation) differ for questions related to *species* from those related to *societies*. Epistemologically, a concern with species focuses analytical attenion upon individuals as units of observation. A concern with societies focuses upon interactions, but especially upon a particular kind of interaction. That is, interactions which are not necessarily derivable by knowledge of the individuals engaging therein. In other words, we are suggesting that social behavior be conceptualized as limited to behavior which occurs only between two or more individual animals, and which cannot be related to any inherent characteristic of the participants as individuals. For example, true copulatory behavior, in its reproductive sense, can occur only between animals of differing sexes. In contrast, "greeting and recognition behavior" occurs between and among conspecifics regardless of sex, age, etc. of the participants although its form and frequency of occurrence may co-vary with these variables. For the study of a so-called social species that which is problematic as Wynn-Edwards (1962) reminds us is the survival of its social organization as an adaptive mechanism. As such it would seem that

which is truly social in this more limited conceptualization is the appropriate observational phenomenon.

Within the ethological literature the concept of ritual and the process of ritualization are well established concepts. Perhaps it is to these kinds of phenomena that we should restrict our analytical focus when we seek to study the social behavior of a species. For species which are social, survival is preordained by social organization and we need to sharpen our analytical tools for its study. A conceptualization of social behavior which offers such operational specifications may be heuristically useful.

To terminate these remarks, we turn to observations on the study of leisure among *Homo sapiens* (bearing in mind the ethological literature).

Homo ludens - fantasy or factual?

The variety of conceptualizations of leisure and play, with reference to the social organization of *Homo sapiens*, are many. Thoughts regarding leisure encompass definitions of it as a commodity, a state of being, behavior, etc. Arguments swirl about its utilitarian and nonutilitarian aspects. These attempts to account for the phenomena become rapidly ensnared ideologically.[1] In part, this situation is because of the metaphysical problem of what is a social act which Professor Wallace (1969) has identified; but it is also because of a similar inattention, relatively speaking, to the analytical level at which studies of social organization are often undertaken in the social sciences. The certainty with which opinions are offered about the theoretical importance, or lack thereof, of the study of leisure both in social science and biological science seems curiously unmatched by empirical observations to support or refute such contentions. The kinds of observations required, we believe, are similar to those found in the ethological literature yet few observations exist. Lacking such, we can still examine what is *known* about play among *Homo sapiens* in terms of the Dolhinow and Bishop (1972) statement. We can assess, in a most preliminary manner, how similar this social species may be to other primates.

[1]Professor Burch (1971) has examined these matters in his *Images of the Future* contributions.

Again we remember our purposes are heuristic in this exercise. Recognition of the fallacies of argument by analogy are too well known for further comment.

Clearly, *Homo sapiens* is of the class *mammalia* and does exhibit behavior commonly recognized as play and leisure. Such behavior is usually regarded as social, though the relationship between so-called child's play and the play of adults requires further specification. It is not clear whether recreation is the same as play but merely participated in by differing age grades of the species. Or whether recreation is a kind of cultural "emancipation" of behavioral elements common to play, but defined differently, occurring within certain kinds of societies (hence social organizations) but not in others. One suspects the presence of behavioral similarities because attempts at further specification usually elicit similarly named activities when examples of play, leisure or recreation are examined.

Homo sapiens tend to follow the primate pattern of limiting the behavior of play to certain environments apparently similar in character to those noted by Dolhinow and Bishop (1972). The presence of parklands, or their analogs, in many cultures may reflect more than the mere operation of cultural diffusion. Despite the terminology employed, albeit open space, park, garden, freehold, health, etc. the similarity of the behavior observed is quite remarkable. Above all this similarity suggests that such locales may constitute strategic research sites for studies of play and leisure among *Homo sapiens*, at least in this society. One might hope that some of the efforts presently devoted to planning for such sites (which currently appears to be so much in vogue) might be employed first in understanding what the behavior is that is transacted so often therein. Apparently among *Homo sapiens* the "setting off" of play is situationally similar to other primates. Why this should occur for any species remains an important problem. Once it can be identified empirically, then to continually ignore its occurrence is to ignore the probing of the essence of all societies, that is, what Georg Simmel (1950) called sociation - behavior not explainable by appeal to individual characteristics. The ethological perspective may stimulate social scientists to reconsider anew previously classified and evaluated behavioral repertoires observed among *Homo sapiens*.

Conclusion

To recapitulate, I have suggested:

a) opportunities for cross-fertilization exist between the biological and social science traditions for the study of social organization;
b) one means of furthering such opportunities is a common conceptualization of what is a social act, useful to both traditions; and
c) the study of play and leisure as social behavior suggests itself as a particularly good common meeting ground since well established ideological positions do not yet exist with respect to it in either tradition.

It is hoped that these remarks will assist in the working out of this process.

CHAPTER THREE

WILDERNESS: TO BE OR NOT TO BE?

RODERICK NASH
UNIVERSITY OF CALIFORNIA, SANTA BARBARA

Over a century ago, on April 23, 1851, Henry David Thoreau rose before the Concord Lyceum and declared his intention to say a word for wilderness. The need persists. Indeed it has increased because our time is radically different from Thoreau's. His world was comparatively empty; ours full. His generation of Americans was only in the early innings of exploration and exploitation; ours has reached, and in some respects surpassed, the limits of the earth. Wilderness has been an inevitable casualty. When Thoreau addressed the group in Concord, a conservative 50 percent of the United States was wilderness by most definitions. Today the percentage of wildland in the continental forty-eight states is about three, and the same amount of the American landscape is paved! Scarcity itself creates an argument for preservation, but many still ask, "can we afford wilderness?"

Doubts about wilderness are expected among the growth and development-oriented. It is more disturbing to find them among people who have lately acquired the label "environmentalists". Wilderness, they say, has little to do with the environmental crisis. It's an amenity, not a necessity. Keeping land wild is like keeping highways free of billboards—it's nice but it's not a "gut" issue like keeping air, water, and the food chains unpolluted and population controlled. Wildland figured in the cosmetic-like "beautification" variety of conservation associated with Ladybird Johnson in the early 1960s. By the end of the decade, this line of reasoning persists, the frontiers of the environment movement had moved from a concern with beauty to a concern with survival. We shouldn't waste precious time even talking about luxuries like wild country. Isn't worrying about wilderness comparable to arranging the deck chairs on the *Titanic*?

These remarks seek to expand on this value of wilderness and to propose others. This essay will succeed if it delineates the collective contemporary wisdom on the meaning and importance of wilderness to civilization. Much of the argument necessarily builds upon the author's *Wilderness and the American Mind* (Nash, 1973), but nowhere in that volume is the case for wilderness distilled to the list of values that follows:

1) *Wilderness as a reservoir of normal ecological processes.* With so much of the earth's environment disturbed by technological man in one way or another, wilderness takes on importance as a model of healthy, ecologically balanced land. It constitutes a criterion against which to measure the impact of civilization. Without it, we have no conception of how the land mechanism functions under normal conditions. And such a conception will become increasingly important as we seek to understand and restore lost natural harmonies. Ecology needs wild places, in short, as medical science needs healthy people.

A corollary to this value of wilderness stresses its importance to the preservation of biological diversity. In wild country the plants and animals that man shortsightedly regards as "useless" find a sanctuary. As a result such life forms are preserved, banked, against the time when man may need them—to invigorate a crop species, for example, or to cure a disease. As David Brower is fond of saying, wilderness holds the answers to questions man does not yet know how to ask.

It is axiomatic in ecology that there is strength in diversity. One interpretation of the principle is that the size of the gene pool of life on earth should be maximized. Monocultural agriculture, not to speak of urban sprawl, has frightened man with the prospect of refining his environment to the point where it is vulnerable to sudden shocks. Wilderness, the unrefined environment, assumes importance as a starting point from which civilization arose and to which it could return in the event of failure. This is implicit in Aldo Leopold's observation that "it is only the scholar who appreciates that all history consists of successive excursions from a single starting-point to which man returns again and again to organize yet another search for a durable scale of values." Wilderness is the starting point. Without wilderness, conversely, man is totally committed to the increasingly synthetic environment he has

created in the last 15,000 years, or since the beginning of herding and agriculture.

This value of wilderness is rather unusual in that it does not entail human contact. Just to have wild places out there, somewhere, is enough. They may not be used, or even seen, for centuries. But when they are needed a desperate civilization will be thankful they have been preserved. Of course this is anthropocentric, but the argument can be stated in such a way that it is the planet's life force itself that is the object of protection, not the welfare of *homo sapiens*.

2) *Wilderness as a nourisher of American culture.*

Time and again wild country has been the source of inspiration to what is distinctively American in literature, painting, and music. It nourished the first distinguished American endeavors in these fields. James Fenimore Cooper's novels rose above mediocre imitation when he used a wilderness setting in 1823 in *The Pioneers*. His contemporary, the painter Thomas Cole, also turned to wilderness to launch the Hudson River School and begin a native tradition in landscape art. "Twilight in the Wilderness," painted in 1860 by Cole's pupil Frederick Church, marks the zenith, in many opinions, of 19th-century American art. Albert Bierstadt and Thomas Moran found their brushes inspired by the virgin landscape of the American West. Subdivisions and used car lots seldom produced great art; the American wilderness frequently did.

The Transcendental writers, Ralph Waldo Emerson and Henry David Thoreau, did much to explain and to illustrate the relationship between wilderness and culture. If America was ever to throw off the controlling force of Old World culture, they contended, it would have to identify and utilize native materials. Wilderness was an obvious choice, particularly since it was notably lacking in the highly civilized European environment. Wild country was something to be proud of, not embarrassed about, the Transcendentalists argued. Indeed it could be one of the bases of patriotism. Moral and aesthetic truths, according to their philosophy, were closer to the surface in wild places than in regions where civilization interposed a layer of artificiality between man and nature.

Wilderness, for the Transcendentalists, was intellectual fertilizer. Blended with civilization in the proper proportion, it produced cultural greatness. The grandeur that was Rome at its

zenith, Thoreau often observed, began with infants suckled by a wolf. When these wild roots were buried under too much civilization, Rome declined and fell. The conquerors, significantly, were wilder people—barbarians from the northern forests. America, too, had the cultural advantage of wild origins. Valuing and preserving wilderness would be one way to insure they would not be forgotten.

Twentieth-century writers and artists have continued to turn to wilderness for cultural inspiration. From imaginative writers like Willa Cather and William Faulkner to poets such as Robinson Jeffers and Gary Snyder, wild country has provided both the substance and the symbolism for creativity. Utilizing a new medium, photographers Ansel Adams and Eliot Porter have continued many of the traditions of the 19th-century landscape painters. And the musical contributions of Ferde Grofé and John Denver should not be overlooked as cultural products of wilderness experience.

Some individuals have moved beyond an understanding of wilderness as a nourisher of culture to a sense of its value as a *part* of culture. For Robert Marshall, the leading advocate of preservation in the 1930s, wild country was a work of art. In reply to the question, "how many wilderness areas do we need?," Marshall invariably replied, "how many Brahms symphonies do we need?"

3) *Wilderness as a sustainer of American character.*

It was not until the census returns of 1890 signalledthe end of the frontier that many Americans began to ponder the significance of wilderness in determining what they were as individuals and as a society. The link between American character or American identity and wilderness was forged during three centuries of pioneering. This was, of course, the central insight of historian Frederick Jackson Turner's 1893 essay "The Significance of the Frontier in American History." But it didn't require Turner to inform Americans that many of their most prized traits bore the stamp "Made in the Wilderness." Independence and rugged individualism were two heritages of pioneering, and pioneering was only made possible by the presence of wilderness. A democratic social and political theory as well as the concept of equal opportunity and a penchant for practical achievement were also frontier products.

The problem of national character has plagued America since the

Revolution. What was this upstart society? What united the heterogeneous man and made it appropriate to call it a *nation*? Wilderness, and the pioneering it made possible, was one answer. If anything, it was our common heritage. Certainly it was our oldest tradition. And as the wild shaped our national character so it shaped our national values and institutions.

It followed that one of the most important values of wilderness was keeping alive American traits and American styles. The fear of what we would become *without* wilderness testified to the importance we attached to it in this regard. Aldo Leopold put it well in 1925, about the time the nation became more than 50 percent urban. "Is it not a bit beside the point," Leopold wondered, "for us to be so solicitous about preserving American institutions without giving so much as a thought to preserving the environment which produced them and which may now be one of our effective means of keeping them alive." Authorities from Theordore Roosevelt to the Boy Scouts echoed similar sentiments, increasingly so as civilization became more omnipresent and wilderness vanished.

There is another sense in which wilderness supports American traits and institutions. Its very existence serves to confirm the American political tradition of respect for minority rights and thus for our conception of democracy. Only a fraction (albeit a growing one) of the American people cares about wild country. Only a fraction cares about opera or weightlifting. And wilderness preserves require special commitment because they lay claim to substantial space. Their existence helps strengthen respect for minority interests.

4) *Wilderness as Historical Document.*

Historians are beginning to look upon landscapes as historical documents. Understanding the past, after all, entails knowing more than what people said and wrote. It is crucial to know how they *felt*. It is vital to perceive the environments they perceived. And wilderness has been around a lot longer in the American experience than has civilization. It was a fact of life, often the biggest, for many generations. How are we going to understand these people—their hopes and fears, their achievements and failures—unless we too can know their environmental circumstances? We are not, to take one example, going to learn much about the ill-

stanned Donner Party by whipping across the Sierra on Interstate 80 or by visiting a Frontierland. We will fail to grasp the significance of the John Wesley Powell expedition water skiing on the Utah reservoir that bears his name. We must know wilderness if we are to know what motivated pioneers on every frontier to establish order and organization.

We could, to be sure, abandon the link to the past that wilderness provides. But we would be the poorer for this collective amnesia. We are what we have been. History and its keeping are much more than academic functions; they are part of what being human is all about. On the Arizona desert this became clear in the attitude of the irrigation farmer whose fields stretched away from his comfortable ranch as far as the eye could see. But right in front of the house was an unfarmed acre, choked with cactus and creosote bush. Visitors frequently asked the farmer why he had not developed that land like the rest. "Well," he said softly, partly embarrassed, "I kept that to remind me what it all was like once." There should be no need for embarrassment. Wilderness is what all America once was; without an enduring sample to jog our memories we are the poorer as historians and as human beings.

5) *Wilderness as ego trip.*

In a different category than the above values but still important in the case for wilderness today is its significance as a setting for glorifying the individual. It's a *macho* thing. It's not really the wilderness but the person that is valued. The "peak bagger" is in this category; so is the miles-per-day freak. A related species is the equipment nut for whom the quality of his backpack or sleeping bag is more important than the place in which he uses them. The photographer enslaved to his instruments fits into the same category. His only view is through the finder. His pride is not in revealing wilderness but in demonstrating his own prowess. The solo survival camper of the Outward Bound variety is, of course, on a classic ego trip. So was Lewis in *Deliverance*, the book and the film. So are many who hunt and fish in the wilderness.

More seriously what is involved here is quite understandable if we are honest with ourselves. It has to do with proving the individual. It has to do with pride. Wilderness is a stage, and it has marked advantages compared to civilization where tools and con-

veniences reduce the individual pride in his *own* accomplishments. Wilderness, on the other hand, demands self-sufficiency. To succeed in wilderness is primarily a demonstration of the person. A hike of 10 miles has more meaning in this respect than a flight of 10,000.

6) *Wilderness as a setting for fear and pain.*

There is supreme irony in civilization's elimination of fear and pain from the lives of most persons. For eons man dreamed of and labored toward escaping from the anxities and hardships associated with a wilderness situation only to find that when he reached the promised land of safety and comfort he had forfeited something of great value. The importance of fear and pain stems from their role in human evolution. Time and again these things motivated man to great deeds. Fear and pain were energizing forces—springboards of achievement long before success and status. In fact physiological research demonstrates that fear of death and pain are far more powerful forces than either hunger or sex. The gut-level fears associated with survival drove the wheels of evolution.

Today's civilization has ushered in for most normal people most of the time life without fear. Can you think of the last time you were really *afraid*—not just frustrated or tired or annoyed but really scared for your scalp? The value of wilderness stems from its ability to strip away the civilization that normally buffers man against fear. It is possible to get lost in wilderness, to die of exposure or hunger, to be attacked by an animal or bitten by a snake days from hospitals and credit cards and yet the possibility of encountering these dangers is one of the fascinations of wilderness for some who seek it.

Experiencing wild places, man treads the paths of primordial experience. He learns to live with fear again, to be cautious, prudent, inventive when all the chips are on the line. Similarly, man in wilderness learns to push against the frontiers of pain. Man needs wilderness because civilization, while safe and soft, is horribly dull as an unrelieved diet. The contrived situations attained through athletics do not hold complete satisfaction for some individuals. For them only the ultimate tests of wilderness living will suffice to fill the gaps in human need left by civilization. Wildland today holds forth one of the few remaining opportunities of recovering, if only temporarily, the authentic experience of fear and pain.

7) *Wilderness as a sustainer of human dignity and diversity.*

The presence of wilderness has been interpreted as providing insurance against the submergence of individuality. There are several variations on the theme. The most widely compelling sees wild places as "reservoirs of freedom" in the words of ecologist Raymond Dasmann. Wilderness, by definition, is uncontrolled by the pressures of civilization, organization, and homogenization. As such it guards against dehumanization. Wild places are conducive to deviancy, idiosyncracy, and eccentricity in the good sense of these words. They preserve *social* and *intellectual* diversity as well as ecological diversity. Wilderness constitutes an arena where man can experiment, discover, improve. Here was the original significance of the New World for Europeans. The meaning persists in Wallace Stegner's understanding of wilderness as "a place of perpetual beginnings" and, consequently, as "a part of the geography of hope." Just to *know* wilderness exists, Stegner points out, is heartening in this respect. One can value it without visiting it.

For others it is the human spirit that is preserved along with wilderness. Aldo Leopold recognized the relationship when he remarked: "of what avail are forty freedoms without a blank spot on the map." To appreciate the point it is only necessary to recall, as wilderness proponents frequently do, the suffocating, total control of civilization as postulated, for instance, in George Orwell's nightmarish book *1984* with its ever-watchful Big Brother. When wilderness exists there is always a place to which man can escape from conformity, a place where he can dare to be different and, in this way, to be himself. In wild country, in the absence of man's technology, man himself stands forth.

The counterculture, as it took shape in the 1960s, had reason to appreciate the relationship of wilderness and human dignity. In their rejection of many traditional values and priorities of American civilization, the countercultural critics turned to the antipode of the displeasing civilization, namely to wilderness. For Charles Reich, author in 1971 of *The Greening of America* (the title itself is significant) asserted that the dissenters were people who had "too much plastic in their lives." In particular, they were concerned about the way centralization, urbanization, and industrialization inhibited free, open, and natural expressions of human feeling. The "establishment," in the jargon of the time, seemed bent on controlling both nature and human nature. As California poet Gary

Snyder put it in the late 1960s, "there is not much wilderness left to destroy, and the nature in the mind is being logged and burned off." Wildness, as a consequence, became a prized commodity in both the environment and in man. The preservation of wild country seemed inextricably linked to the preservation of free men. Perhaps Joseph Wood Krutch summarized it best of all when he observed that "wilderness and the idea of wilderness is one of the permanent homes of the human spirit."

8) *Wilderness as a church.*

With the aid of religion and religious institutions man attempts to find solutions for, or at least to live with, the weightiest mental and emotional problems of human existence. One value of wilderness for some persons is its significance as a setting for what is, essentially, religious activity. In wild country, as in a church, they attempt to bring meaning and tranquility to their lives. Guided by ancient Eastern philosophies, or by the more recent insights of ecology, they seek a sense of oneness, of harmony, with all things. Wilderness appeals as a place to knot together the unity that civilization tends to fragment. Contact with the wild world shows man his place in systems that transcend civilization and inculcates reverence for those systems.

In wilderness, according to the renowned solo backpacker, Colin Fletcher, "you regain a sense of harmony with everything you move through." For him a wilderness experience brings the comforting revelation "that you are part of the great web of life. . . you know the wholeness of the universe, the great unity." Insights like this are the substance of religion, and those who seek them in wilderness are performing religious acts. For them a wild place is just as much a church as a building with stained glass and a steeple. In the backcountry they recover an emotional and spiritual relation to their natural environment that the conceits of civilization often obscure.

9) *Wilderness as a guardian of mental health.*

The veteran northcountry canoeist, Sigurd Olson, notes that "civilization has not changed emotional needs which were ours long before it arose." Sigmund Freud had the same idea when he said that civilization bred "discontents" in the form of repressions and frustrations. One of the most distressing for modern man is the be-

wildering complexity of events and ideas with which civilization obliges him to deal. The price of failing to cope is a psychological problem—which, to a greater or lesser degree, troubles every mind. The "quiet desperation" that Henry David Thoreau believed was the appropriate description of most men's lives is just a synonym for psychological disturbance.

The value of wilderness in this context is the possibility it extends to civilized man to slip back, occasionally, into what Olson calls "the grooves of ancestral experience." As such wild country is a mental health guardian of increasing importance in a society moving ever-further from the old, familiar patterns. Wilderness permits simplification. It reduces the life of those who seek it to basic needs and satisfactions like water, food, and shelter. The hunger of man for self-sufficiency is served in wilderness, and the dividend is self-confidence. Psychologists who have used wilderness trips as therapy for their patients note that the experience is a powerful antidote to defeatism and a feeling of helplessness. Many mentally sick individuals return from wilderness markedly improved. And so-called normal people, given the opportunity to get away from it all in wilderness, return refreshed—prepared to cope once again with the problems of civilization. For them contact with wild environments constitutes a kind of psychological holiday. When we consider that man has, historically, lived in wilderness several million years more than he has lived in civilization, the importance of this release is underscored. We could, of course, build and staff more institutions for the mentally distrubed. Preserving wilderness offers a more attractive alternative.

10) *Wilderness as an aid in developing environmental responsibility.*

At the outset of this discussion preserving wilderness was likened to arranging the deck chairs on the *Titanic*. The metaphor expressed the viewpoint that keeping part of the planet wild did not have much to do with its pollution problems and with the long-term survival of its life complement.

The rebuttal might start, using the same metaphor, with the observation that wilderness is essential to stopping the *Titanic* or at least altering its course. This belief rests on the assumption that man's most serious environmental problem is the pollution of his *mind*. Mind pollution involves values, attitudes, and priorities, and

these are at the core of the environmental crisis. They power the whole exploitative juggernaut. Man's machines, after all, are not the basic problem. Machines are tools, used at the discretion of their makers or owners. Science and technology have only implemented human desires. Conversely, science and technology will not bail man out of his environmental problems unless there first occurs a change in the priorities that ushered in the problems in the first place.

Wilderness, rightly seen, can be a powerful aid in building stable, long-term harmony between man and environment. Its value is both educational and symbolic. Humility is a part of what is needed and what wilderness can teach. To experience wilderness is to rediscover natural processes and man's dependency upon them. This realization is difficult to achieve in civilization. Aldo Leopold put it well in 1941: "civilization," he wrote, "has so cluttered the elemental man-earth relation with gadgets and middlemen that awareness of it is growing dim. We fancy that industry supports us, forgetting what supports industry." Contact with wilderness is a corrective that modern man needs desperately. It is one of the best places to learn that milk doesn't come from bottles or meat, neatly wrapped in cellophane, from a supermarket. It is a place to perceive man's vulnerability. Humility emerges from such knowledge, and it is a prerequisite to any meaningful reordering of man's relationship to the life-support systems of his only home.

Wilderness also has the ability to teach man that "community" is a concept that must ultimately extend to the limits of life and the earth itself. Because wild country is beyond man's control, because it exists apart from man's needs and interests, it suggests that man's welfare is *not* the primary reason for or purpose of the existence of the earth. Seemingly simple, this truth is not easily perceived particularily in a culture whose hallmark is control and whose self-esteem is hitched to the idea of man's separate creation in the image of the diety. In wild country, on the other hand, it is not difficult to regain the sense of respect, indeed of reverence, for other life forms that our wilderness-dwelling forebears instinctively felt. Man is a member, not the master, of the biotic community. In wilderness we appreciate other powers and other interests because we find our own limited.

An outgrowth of this enlarged idea of community that contact with wilderness intensifies is an expanded ethic. Man has the

capacity, some philosophers believe, to organize relations between man and *land* on the same ethical basis as those between men. Some suggest that unless such an ethical extension occurs, the foundations of the conservation movement will always be laid in sand. From this perspective we are concerned about environmental quality and harmony not because it is profitable or beautiful or even because it promotes our survival, but because it is *right*—a matter of morality. Such a realization stems from the expanded concept of an interdependent community for which wilderness is a primary demonstration and argument. Wild country is available, if man can only recognize its value, to show the way out of the morass of egocentricity that threatens the entire ecological structure on which all life depends.

An appreciation of the meaning and importance of restraint is the final contribution of wilderness to environmental responsibility. Here wilderness is primarily a symbol. When we establish and preserve a wilderness area we say, in effect, thus far and no farther to development. We establish a *limit* and in doing so we accept the concept of self-imposed limitation. For Americans self-limitation does not come easily. A thirst and a talent for conquering nature, for growth, for progress in a quantitative sense came over on the *Mayflower*, crossed the Oregon Trail, and now seeks new frontiers among the stars. But a countercurrent of dissent has begun to flow against the mainstream. Wilderness preserves are symbols of this revolutionary new attitude. Wilderness parks and preserves mean that if we can't prosper without a dam or mine or mill within a wilderness, then we limit our prosperity to that extent. We put other considerations before growth. We respect the rights of non-human life to habitat. We challenge the wisdom and the moral legitimacy of man's conquest and transformation of the entire earth. We discover and accept what William Burch calls "the finitude of the world." Such a discovery and the consequent need for restraint is axiomatic to the beginning of the quest for environmental responsiblity.

Wilderness also connotes restraint in a second, direct sense. When we enter wilderness we have the opportunity of refraining from using machines as means of transport. We could use helicopters, for example, but we deliberately limit our power. Here on an individual level is the same demonstration of the capacity for re-

straint that society exhibits in establishing wilderness areas. The possibility of exercising such restraint in wilderness may be one of the most important arguments for its continued existence. People who can, in the 20th century, accept the pace of, say, twelve foot miles a day can also limit their number of cars and children. On the development and spread of such an attitude depends the long-term ability of man to live within the limits of the earth.

The urgency of this issue is underscored by the realization that, in the long run, it will not be the lack of energy or expertise that keeps man from further exploiting the earth to his ultimate detriment. An attitudinal reorientation—the cleaning up of mind pollution—is the only certain deterrent. Wilderness can help in this regard; increasing numbers feel it must.

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