

A Policy for Conservationists

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Humpty Dumpty: When I use a word it means what I choose it to mean, neither more nor less.

Alice: The question is whether you can make words to mean so many different things.

Humpty Dumpty: The question is, who is to be master, that's all.

The word *conservation* is currently used with several different connotations.

First, it is frequently used in the sense of "action of conserving; preservation from destructive influence, decay, or waste," as in the expression *water conservation*.

Second, through a transfer of meaning from the action performed to the responsibility for that action, the word has also a connotation of "official charge and care of rivers, sewers, forests, and so on," as in *Nature Conservancy*.

Third, modification and *expansion* of the first connotation have led to a current U.S. usage according to which the word denotes any action aimed at moderating and restraining man's effect on his habitat, or aimed at using resources in ways conforming to what reason and conscience dictate as being in the best interest of all possible beneficiaries.

Fourth, modification and *narrowing* of the first connotation have led to use of the word *conservation* to denote a campaign (and the associated propaganda and objectives) aimed at preserving, from destruction or change, all remaining natural systems, plants, and animals. Beyond this immediate objective of preserving nature, this campaign seeks to ensure that present and future generations will have opportunity for recreational, scientific, and other activities in natural systems. Hereafter, wherever *conservation* (or its derivatives) appears with a capital C, I intend it in this last sense.

The differences between these connotations are not important in themselves, but insofar as they represent differences of outlook, and stand for

different policies and programs, they have considerable importance at this point in history. In this article I examine some of these differences, chiefly for the purpose of identifying elements which are common to the several programs and campaigns.

In general the issue between conservationists and those whom they think they must fight would seem to be the issue of resource use, except that some Conservationists seem in the main to seek nonuse. "Resource use" means a taking (of minerals, plants, and animals) from natural systems and a converting of materials to human use; it also means, at times, a modification or even total elimination of a system in order that an artificial system may be set up on the site the natural system had occupied.

This is patently an economic definition, to which exception might be taken on the ground that those who engage in recreational and scientific activities in natural settings, or in scientific activities with natural materials and specimens, "use" natural resources. But it would be difficult to convince an industrialist that the "nondisturbance of resources" and the "preservation of resources intact" advocated by the Conservationists represent resource *uses*. Campaigns against particular resource uses are frequently thought to stand for prohibition of all use, and it seems inconceivable to some people that those who wage these campaigns can want a use of resources.

Nevertheless I believe that the strongest arguments Conservationists can bring against things done by the resource users, or in support of some of the special things they themselves advocate, are to be drawn from a theory of resource use, without reference to Conservation, and that most of what they can (and humanity generally should) hope to gain of their real objective is attainable through such a theory, and only in this way.

It is not my purpose to disparage

Conservation; on the contrary I subscribe fully to a concept of human conduct that is rational with regard to immediate and personal need and is compassionate toward others. I believe passionately in a need to restore an element of parsimony to our everyday behavior. I believe, for instance, that if no one ever ate more than he needed for his real nutrition, and if we took the precautions we could to avoid wastage of food in the field, in storage, in processing and transport, in the kitchen, and on the plate, we could have enough food now to feed the world's human population.

However, I also believe that the Conservationists haven't yet made a good case as to what we should seek and as to how we should go about getting it. I believe their current case is based on an inadequate understanding of why they need to make a case, and on a poor estimate of what in fact is within human reach. Their failure in this is a consequence, I believe, of a failure to appreciate certain of the dynamic characteristics of the systems about which they are concerned, and especially man's role as one of these systems. What I attempt to do here, therefore, is to propose some lines of thought that might lead to formulation of a useful conservation campaign.

Man in the Physical World

Perhaps I should first explain my view of man's position in the physical world. It is a defensible philosophy, and a sound working hypothesis, that, apart from the compulsions of nonhuman elements, only man determines man's actions relative to that world, and that the consequences of those actions are evaluated only by man and only in terms of their significance for man. According to this view, which is mine, man has no one but himself to look to for approval or disapproval of anything he has done, or for moderation of the consequences of his actions when these are unfavorable to him.

The alternatives to this hypothesis, as a basis for government, are to disclaim all responsibility or to argue that intimations of our responsibilities and of the direction toward which we should

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move have been given us by some supranatural authority. Few people are prepared to disclaim all responsibility and to accept to the full the consequences of doing so; those who take this course are able to do so only because they can rely upon the rest of the community to protect them from the consequences of their position. As for the alternative, it is an inescapable fact that, regardless of the validity of the evidence that intimations of responsibility are of supranatural origin, every such intimation in due course falls under the scrutiny of human intelligence and prevails only insofar as it satisfies human norms. In any case, religious teachings guide us only in our relations with other human beings, not in deciding what the material circumstances of this life ought to be, much less in deciding what, specifically, we should do about our habitat. Even a conviction that one should not take nonhuman life springs from compassion or some concept of reincarnation; I know of no Conservation propaganda based on it.

Man's only habitat, at least for the present, is the planet Earth. For man as organism, this planet is a heritage, and all of which it is composed is his for whatever use he cares to make of it; but to man as rational being this planet not only offers scope for realization of his own potential but is also a responsibility. Man as animal lives in, reacts with, and consumes and uses up the resources of, his habitat, but as rational being he observes himself in this habitat, notes his effect on it and his responses to it, and learns to conduct himself in accordance with his view of the significance of the relationship that exists between him and it.

The significance of that relationship, however, does not lie solely in his material use of his resource; a substantial element of the argument is that man as rational being recognizes the importance of his habitat to his esthetic and intellectual pursuits. The recreational value of undisturbed natural surroundings is well recognized, even by many of those whose pursuits leave them little time and no inclination to seek such recreation. We cannot forecast what might be the consequences to human behavior if there should come a time when there remained no undisturbed habitat to which people could escape from man-made situations. And what of man-molded landscape? On an eminence in Tuscany one is sensible

of the unity of the rural tapestry at one's feet; its patterns, though fashioned in part by man, express nature in the sense that man's activities seem to be one with the burrowing of the field mouse and the tree's shedding of its leaves. Clearly, such intimate association with living nonhuman elements is not essential to man, for he can quit such homes to live in cities, substituting brick and mortar for pasture and woods; nevertheless, much evidence points to the persistence in him of a need to return to his rural setting.

Again, natural systems are of great interest to scientists and are important sources of material for scientific studies whose results will undoubtedly be of relevance to a man-made world. It is impossible at this time to assess the potential value of natural systems for these purposes. Moreover, we have no way of assessing the potentials (notably in the field of genetics) locked up in these systems and being thrown away with every destroyed ecosystem. At a simpler, more material level, we recognize that we now frequently use our resources much less efficiently than we might with our present knowledge, and probably much less efficiently than, through science, we will in the future. It often happens that we put some resource to a use for which, we later discover when a new technology is developed, some alternative resource is much better suited, and we find that we have spent our inheritance unnecessarily.

This habitat in which man finds himself is not inert material to be shaped by him to enduring form; on the contrary it is a constantly changing complex. The movements of stars and planets impose a basic pattern of regular change, as witness the coming and going of each season in its turn. Wind and rain, frost and heat are constantly cracking the mother rock and reducing it to soil, while eroding the softer materials of the earth's surface; the seas gnaw at the shores and spit up sand and silt which form deltas, bars, and beaches, and then tear these away again; plants and animals pass through individual life cycles; their species populations pass through cycles of abundance; their dead remains rot and are reconverted into nutrient salts, which are soon reused or are stored for a while as coal or oil or other deposits.

Man, even if he would, can neither halt this ceaseless change nor divert it. Our observation that much of the

change is cyclic and repetitive encourages optimism, but all of it is driving toward irreversible ends. Man can influence some of these changes or modify their pace and direction, but he cannot halt them; he may accelerate some and decelerate others, but he can stop none of them, except briefly. In all this he is engaged in an unremitting contest in which a moment's relaxation may mean the loss of a lifetime of gained ground. For example, in a particular situation people of one generation may accelerate the soil-forming and nutrient-storing processes and thus leave soils that are deeper and richer than those they inherited; yet equally easily they may slow down these processes of soil growth, accelerate the impoverishing and erosional processes, and in the end leave less soil than they received. In critically balanced situations a neglect of antierosional practices may open the way to total removal.

Thus it follows that what one generation inherits from the generation that preceded it is not merely an accumulation of past products, an inventory to which the preceding generation added its quota. On the contrary, each generation receives the sum and product of past changes increased or reduced and changed in character by the preceding generation's influence on the processes of change. Thus, man of today inherits a habitat which bears the consequences of the actions of his forefathers, and he bequeaths to the next generation a habitat still further changed. That each generation must leave its imprint is so certain as to seem to impose almost a moral obligation. It is of the utmost importance to recognize and accept this fact of change, and to base policy on the certainty that change will occur rather than on a vain expectation of immutability or on nostalgia for what was and cannot be again.

The question, then, is: What kind and what degree of change, from one point of time to another, is appropriate and acceptable? And the crux of the conservation problem is to find rational grounds on which to base an answer to this question for each of a very great number of situations and occasions. As yet we have no such basis; we have no ecological calculus capable of assessing finely graduated distinctions in the interactions of the great many elements of ecotic situations and of predicting with accuracy the benefits and disadvantages of different courses of action.

In the absence of such a calculus we are obliged to operate with much cruder systems. One school, so based, says: "No change at all, but if there must be change let it be of the smallest possible degree." Another says: "Any change of any kind and of any degree is desirable if present economic benefit can be got from it." Here the government's usual role is to effect compromise—an uneasy situation in which adherents of the first school can rarely hope to do better than postpone what adherents of the second intend to do. The fundamental fault of this system is that in neither case is argument based on fact, and in neither does conclusion flow from argument.

For this situation the remedy is a policy, with respect to resources, that is based on a theory which takes due account of propositions such as the following.

1) Habitats change irreversibly (1); this is the nature of our world. This proposition can be set out in detail as follows. (i) Change is a major characteristic of all that man knows, and especially of his habitat. (ii) Changes taking place in the habitat are generally accelerated by human activity, and the rate of acceleration seems likely to increase. (iii) The changes are irreversible.

2) Man must use his habitat as a whole and he must use particular parts of it. He contributes to and participates in changes in habitat, and in varying degree he is a determinant (often the major determinant and sometimes the only one) of the kind and range of change that occurs.

3) Man has a capacity to analyze the systems of the natural world (including himself); to ascertain the connection between cause and effect; to measure the role of each component; and to some degree to predict the outcome of events. Thus he is highly aware of what is going on about him and of the consequences of his own actions. At the same time he has a capacity for reasoned abstention—that is, he is an ethical being.

4) Man at any point of time stands in a threefold relationship to his habitat. (i) As a user of its resources he materially changes the habitat. (ii) As a sentient being he needs to be in a special relation with particular parts of his habitat in pursuing recreational, scientific, and other activities unrelated to material concerns. (iii) As an ethical being he recognizes his responsibility to

act as warden of his habitat, on behalf of future generations, in respect to both the known and the as yet undiscovered value of the habitat as a source of resources, of scientific information, and of refreshment and renewal.

5) Conservation, which is not a synonym for government as a whole and is not concerned with technologies (theoretical or practical) of resource use, is concerned with habitat as a whole and with the overall human strategy with regard to habitat. It represents a combination of science, management, and ethics.

6) Man's exploitative activities are generally directed toward one or a few components of a system and result in the disturbance of such balance as the system may have, whether that system be a body of water, soil, or a plant and animal community. Generally the disturbed system moves toward a new equilibrium, and means can be found for directing such trends toward acceptable new equilibria. Disposal of wastes from man's activities similarly disturbs natural systems; although the production of these wastes might perhaps be reduced, it is unlikely ever to cease, and, again, means must be found for so directing the effects of such wastes as to lead to acceptable new equilibria in these systems. In the case where man eliminates an ecological system, as in razing a forest, the only possible remedy is the creation of an acceptable substitute habitat where the natural system once stood.

7) Man has an especially heavy responsibility as guardian of gene pools.

Every action in the physical world has a dual significance—a present and a future one—and man is in a special position in that he is aware of this duality and able to control his own actions in the light of his thinking about the duality. Nevertheless, it makes no sense to speak of one generation's expecting something from the generation that preceded it, or of making any claims upon that generation. No generation is standing somewhere waiting to take over from the preceding generation, for each generation is born into what it is to receive, and there are no beneficiary expectations of which the actuality can fall short. There is no court to which one generation can go to file a claim against some other generation that preceded it. This means that the rationale of man's actions with respect to his habitat is based, not on any expectations or on any legal rights,

but on some other, more general prevailing principle of total response with respect to man, not as individual, not as generation, but as a species and as persons throughout time. Man of today cannot make for man of tomorrow the decisions of tomorrow, but in framing today's decisions he can give thought to the consequences, for the man of tomorrow, of giving effect to today's decisions. A policy for conservation therefore will seek to lay down basic principles which, if followed, will contribute toward securing for humanity as a whole the best we can hope to draw from our habitat. A policy for conservation grounded in these principles should state the major courses of action the community is willing to take in pursuit of those objectives, and should indicate certain main lines for a program.

Objectives and Principles

The objectives of the community and the government with respect to resources should be to control and direct the use of resources and interference in resource systems so as to yield maximum short-term and long-term benefits. Resource use should not proceed haphazardly, guided, in the conservation sense, only by campaigns that urge the prohibition of particular courses of action only for local and special reasons. Resource use should be part of a total program aimed at securing all manner of benefits for mankind. In general, the natural landscape should be preserved, and its plants and animals protected, unless and until it can be shown, for each instance, that a greater benefit for mankind can accrue from some use. There should be a requirement that every resource-use project include appropriate restorative or compensatory measures. Under the policy, specific courses of action will seek to prevent unnecessary changes; to moderate, improve upon, and gain advantage from the consequences of those changes that must be made; and to provide replacement where major changes are necessary.

The rules to be observed under this policy will be of the following kind.

1) No plant or animal (as individual, stock, or species) should be destroyed unless its continued existence is not essential, its removal does no harm to the natural community to which it

belongs, and distinct benefit accrues to the human community at large through the benefit that accrues to those who remove the organism. Alternative grounds for destruction could be that the organism is noxious to man, either directly or indirectly through the natural community to which it belongs, and that the consequences of its removal are, on balance, beneficial.

2) There should be no further modification of, or interference with, water, air, soil, substrate, rock, or biotope unless the immediate and necessary benefits of that modification are accompanied by long-term benefits.

3) There should be neither deliberate nor careless acts in contravention of the above, either directly, as in hunting and mining, or indirectly, as in pollution and the use of insecticides.

Expressions such as "greater benefit," "not essential," and "harm" in the foregoing statement of objectives and rules would seem, *prima facie*, to leave the door open to all the ambiguities,

equivocations, and special pleading whose reduction (elimination would be impossible) would be one of the by-products of an effective policy. Yet a close study of this text will show that these expressions are valid, *at this time*. For, if into the fabric of government (not merely into the text of some of the laws) can be woven (i) an ethic in respect of choice of objectives in resource use, (ii) a principle, drawn from an understanding of natural systems and a recognition of the inevitability of change, and (iii) a methodology, drawn from an ecological calculus, for directing and profiting by change, then the questions What? and Whom? and At what cost with what benefit? will less often be answered in selfish and expedient terms.

To me this means that the task, in a democratic society, is the double one, not of R & D, but of E & R—education and research. The greatest problems of our day lie in the fields of the ecologists and the social scien-

tists. These sciences have yet to reach maturity; when they do, the authority with which their practitioners will be vested will be considerable. At that time it will be important that the community at large be cognizant of the concepts and practices of these sciences so as to be able to accept and assimilate their results and to keep within bounds the authority of those who have obtained the results. I see many reasons why ecology will and should take precedence in this program (2).

References and Notes

1. I use the word *irreversibly* deliberately, sharing with the Greek philosopher the belief that you cannot step into the same river twice.
2. As a practical step I have collaborated in the formulation of a scheme that will accelerate the growth of ecology and the dissemination of an understanding of it, by basing science teaching on studies of ecosystems; see G. L. Kesteven and R. Maddever, *Educ. News*, 11, No. 1, 16, (1967).
3. I thank Bruce Grant and David Tanter of the CSIRO Division of Fisheries and Oceanography, whose conservation activities led to the writing of this article, and whose criticisms of its first draft led to what I believe to be important improvements in some of its argument.

NEWS AND COMMENT

Military Funds: Senate Whets the Ax for ABM, Research, "Think Tanks"

The military budget has long been the most sacred cow in Congress. But, in this year of scanty feed, an increasing number of Congressmen have concluded that it is time to subject it to the same reduction in rations that will be imposed on other federal livestock this year.

The tendency seems to be most evident in the Senate, and this is not surprising since the upper chamber has generally been the more adventurous of the two bodies in recent years. The stimuli to military budget-cutters are at least twofold. First, with a widely shared agreement that several billion dollars must be cut out of next year's budget, Senators, especially liberals, have increased their determination that the non-Vietnam part of the military budget shall be subjected to the same close scrutiny that will be given their cherished domestic programs. Second, several senators were pleased and surprised that efforts to cut military spend-

ing received impressive numbers of votes when the Senate considered the bill authorizing military hardware and R & D in mid-April. The April "revolt" against military spending seemed especially significant since it was spontaneous and was conducted without much advance notice that the bill would be brought to the Senate for consideration. Nonetheless, by a vote of 45 to 13, the Senate cut the authorization for R & D and for military hardware by 3 percent, after the committee had already sliced 3 percent from the Administration request. Senators could not remember when the Senate had last had the audacity to cut military requests on the floor of the Senate. The Senate only narrowly defeated an amendment by Senator Philip A. Hart (D-Mich.) to cut the \$7.9-billion R & D authorization by more than \$500 million, an amendment by Senator John Sherman Cooper (R-Ky.) to prohibit deployment of an anti-ballistic missile (ABM) system until

the Secretary of Defense certified that it was "practicable," and an amendment by Senator Joseph S. Clark (D-Pa.) to prohibit authorization of funds for the procurement of fast-deployment logistic ships.

With better organization, the military budget-choppers hope to have better luck later on this session when other military funding measures come before the Senate.

One of the most significant additions to the ranks of the military budget-cutters is the respected Senate Democratic Leader, Mike Mansfield of Montana. Mansfield not only voted for the cutting amendments but even took the extreme step of voting against the entire authorization as a protest "against the wasted billions which I believe are embodied in this measure." One area in which Mansfield is likely to make further attacks is that of Department of Defense sponsorship of research. In the April debate in the Senate, Mansfield commented that the Defense Department sponsored "almost unbelievable projects totally unknown to most Americans unless by chance one either heard about them or read about them. . . . These are projects that should be looked into and scrutinized with the greatest of care."

Although the relevant congressional committees have generally gone along