was watching us and them. Millions of Americans concluded, without any systematic evidence, that the record of our men in Korea was shameful. There were those who indicted all our POW's (together with their delinquent parents and teachers, who had never bothered to prepare the kids for an encounter with Chinese Communist interrogators), and drew invidious comparisons between the behavior of our men and the behavior of other national groups engaged in the Korean fighting—including the enemy forces. Events such as the riots in the prisoner-of-war compounds on Koje-do Island were taken as evidence that the Chinese and North Korean prisoners under the military control of the United States were fanatically active and rebellious against their captors. In contrast, our own men were passive or outwardly collaborative in captivity. The fighting men of other United Nations were tougher and more heroic, we were told.

This book, like the earlier studies of American POW's, helps to destroy such erroneous notions, and popular assumptions regarding thought reform as well. The data help to explain the behavior of POW's in more rational terms. Such factors as the battle situation, the nature of the journey to a campsite, the condition of the camp, and the day-by-day treatment they received from camp authorities explain the behavior of many POW's, whatever their national origin.

The widespread assumption that ideological conviction alone determined the enemy's military (including POW) behavior is opened to question here. Similarly, the widespread fear that large numbers of our men were ideologically converted by the enemy's exotic brainwashing techniques was not in the least supported by earlier research. Yet the brainwashing myth gained increasing currency during the post-Korean decade, even among those quite familiar with the contrary results of numerous studies. Cooperative activity, it was argued, must have been ideologically inspired. There are some today who hold to this belief, maintaining that we can strengthen the fiber of our warriors (many of whom have no better than a 9th-grade education) only by teaching them the virtues of Jeffersonian democracy as against the dialectic errors of Marxist communism. Although we at home are often clearly moved more by things than by ideas, we expect that our soldiers, by some miracle, will be otherwise, even in the sordid and deprived conditions of captivity. Research data have made it clear that collaborative behavior in the Korean compounds can be understood in terms that are altogether of this world, without reference to a magical world in which brains are laundered wholesale.

Our readiness to sit in uninformed moral judgment on our repatriated POW's was perhaps the only truly shameful element of the entire Korean episode. None of us can fairly condemn the men who suffered the indignities and privation of Korean captivity. Yet many did condemn them, without questioning how they themselves would have cast their lot.

The publication of these hitherto classified studies is intended to serve both readers who are interested in the China field and those who are concerned with political warfare and the consequences of captivity. The editors see the materials as more than an analysis of the impact of captivity—as constituting an important document about social relations and political integration in Communist China. Perhaps they are that. But even more important, it seems to me, is the fact that these data provide an excellent backdrop against which to view our harsh judgments of our own POW's.

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A Fit Home for Earth's Noblest Inhabitant

A Different Kind of Country. RAYMOND F. DASMANN. Macmillan, New York; Collier-Macmillan, London, 1968. x + 276 pp., illus. $5.95.

The Last Landscape. WILLIAM H. WHYTE. Doubleday, Garden City, N.Y., 1968. ix + 376 pp., illus. $6.95.

Planning for Diversity and Choice. Possible Futures and Their Relations to the Man-Controlled Environment. A conference, Dedham, Mass., 1966. STANFORD ANDERSON, Ed. M.I.T. Press, Cambridge, Mass., 1968. xii + 340 pp., illus. $12.50.

The Fitness of Man's Environment. Papers delivered at a symposium, Washington, D.C., 1967. Smithsonian Institution Press, Washington, D.C., 1968 (distributed by Random House, New York). 250 pp. $5.95. Smithsonian Annual II.

One hundred and five years ago George P. Marsh warned that "the Earth is fast becoming an unfit home for its noblest inhabitant" and that if man continued in his ways he "would reduce it to such a condition of impoverished productiveness, of shattered surface, of climatic excess, as to threaten the depravation, barbarism, and perhaps even extinction of the species" (*1*). More than 60 years ago, Nathaniel Southgate Shaler, reminding his generation that they lived on a limited planet, predicted that man "will date the end of barbarism from the time when the generations begin to feel that they rightfully had no more than a life estate in this sphere, with no right to squander the inheritance of their kind" (*2*). As recently as a dozen years ago an inventory of our assault upon our environment (*3*) showed little indication that these messages had reached very many people.

But obviously times are changing. We are becoming more concerned about our environment and about our future. Conservationists and preservationists (both bad words in some circles) are being metamorphosed into "environmentalists" (a term now favored by Stewart Udall). The sense of urgency has evidently increased even since Ian Burton concluded in a somewhat Olympian overview a year ago that "it seems clear that the current wave of interest in environmental quality will continue for a while longer" (*4*). It is a rare newspaper, anywhere in the country, that does not publish almost daily some expression of concern about what we are doing to our environment, and editors are writing editorials about environmental quality that would have lost them subscribers and advertisers not too many years ago. The lawyers are waking up; the American Bar Association has started a new journal called *Natural Resources Lawyer*. Even that opiate of the masses, the TV, shows views of nasty lakes and rivers and besmudged cities, and the familiar fatherly voices that tell us what to think about things warn us that we must be concerned. Unfortunately the TV is somehow unreal, and one wonders whether this sort of effort will not simply make us more sclerotic, as do the action scenes from Vietnam that become confused with the artificial horrors of spy dramas. And in spite of everything there is still too much of the belief

that our technology will solve all our difficulties, that we can satisfy the Pope's wishes by technological reduplication of the loaves and fishes for all those who come to the table and that there will always be space for more billions of people.

Without some strong sense of purpose or mission, something that inspires broad-based public support, we are not likely to get off our present collision course with the inexorable facts of nature. Of the several recent books considered here, Dasmann's is nearest to expressing this needed sense of purpose, perhaps because as a naturalist he is aware of the ecological verities. But such a purpose is not explicitly stated; the main concern of *A Different Kind of Country* is for the preservation of diversity in both wild lands and cities; the trend toward uniformity is considered inimical to human life. Dasmann writes "in the belief that the most important thing we can do is to maintain this diversity so that tomorrow there will still be a different kind of country, a different way of life." He discusses the diversity of environments in many parts of the world, and the wilderness still left to us in North America, including Mexico and Canada, and hopes for the continued neglect of the lesser wild country, often not too far from civilization, that remains an unimproved refuge for many of us whether as a summer place or as an abandoned range we can call "Our Land."

It will indeed be a sad day when there is no longer available to anyone these neglected bits of land beyond the pavement; perhaps the freeway and the high power lines are just over the next hill, but these patches of neglected real estate are the best hope for the diversified experience that is Dasmann's concern. Formal wilderness reserves and national parks are not unmixed blessings, especially the latter, which may be turned into urbanized resorts for too many people. Some aspects of Dasmann's defense of diversity remind me of an odd book published 30 years ago in Denver by an Indian, with diagrams of an ideal reservation–recreational park complex (*5*). But as a veteran of the battlefields of forestry and game management, Dasmann realizes that some of his ideas will not be seriously entertained, and he finds himself in the dilemma of disliking technology but not wanting to give up its benefits. His awareness of these difficulties keeps him fairly realistic.

Dasmann's final chapter is entitled "Planning against progress." In this he suggests that we must first plan to preserve the irreplaceable, unique situations such as the Everglades and the redwoods. Second, we must control growth. It is nonsense to continue to foster the growth of Los Angeles at the expense of the rest of the continent, when there are other sites which may be expanded to cities or where new towns may be built.

William H. Whyte also addresses himself to the problems of our future cities, but it is his thesis that our metropolitan areas "are going to be much better places to live in and that one of the reasons they are is that more people are going to be living in them." The logic of this is somewhat elusive, and one wonders how the author thinks about it since the defeat of

"One of the most ominous threats to the environment lies in the failure of man thus far to provide humane solutions to the problems posed by the spread of his own numbers. No major urban center in the world has yet demonstrated satisfactory ways to accommodate growth." Above, refuse in San Francisco Bay. [From *From Sea to Shining Sea,* A Report on the American Environment, by the President's Council on Recreation and Natural Beauty (Government Printing Office, Washington, D.C., 1968). Photograph by Ted Jones–Stuart Finley]

the Brandywine plan [*Science* **163**, 1180 (1969)], in which he had a professional stake. There is too much detail in Whyte's book for all but the most determined planners: detail about easements, town councils, zoning commissions, cluster developments, and the like. Basically optimistic, Whyte urges us to the planning barricades immediately; we must act now, and vigorous action will give more choice in the future:

> So let's be on with it. Over these past years a great tide of public support for open space and natural beauty has been building up, and now it is at flood. How much longer can we count on it? If ever there was a time to press for precipitate, hasty, premature action, this is it. . . . We have no luxury of choice. We must make our commitments now and look to this landscape as the last one. For us, it will be.

Symposium volumes are always difficult and spotty reading, and the two reviewed here run true to form. Such volumes tend to come to life if all or most of the cross fire and byplay are recorded, and the M.I.T. symposium does include commentaries and does concern some aspects of the broader problem of diversity considered by Dasmann. The participants are mostly architects and social scientists of various persuasions, and some of them express just the sort of equanimity toward increasing population and economic activity that makes any thoughtful ecologist shudder (there were no biologists of any kind at the M.I.T. symposium). A key contribution, "aimed at architects and urban designers," is that of Harold J. Barnett on natural resources. According to this author, there will be an abundant supply of materials from which to build structures and increase cities. A great pity; think what a shortage of concrete would do for mankind. The diversity being thought of here is within cities and aggregations of people, not in the natural environment; control over the plans may well be more from the force of numbers of people and the increasing masses of concrete drawing upon those abundant resources, and we must disagree with the summary statement that "nature is not the limitation for either man himself or his material needs."

Too many of the ideas hopefully offered in this symposium seem to add further substance to Michael Harrington's thesis (*6*) that our century is the victim of an unplanned, haphazard revolution brought about by our technology, and I find little in them to contradict such opinions as that of Norman O. Brown:

> Mankind today is still making history without having any conscious idea of what it really wants or under what conditions it would stop being unhappy; in fact, what it is doing seems to be making itself more unhappy and calling that unhappiness progress (*7*).

It may be protested that this is too severe a criticism to be applied to so many well-meaning symposium celebrants, but it must be reiterated that rather little seems to have been thought of man as an animal and a psychological entity in the midst of all these plans, alternatives, and categorical imperatives for the future; the psychiatrist's definition of ecology offered to the symposiasts by Leonard J. Duhl is not quite real:

> "Ecology" may be defined as that inter-intra confrontation of biological, psychological, social and historical factors that embrace one's family, school, neighborhood, and the many overlapping communities that teach values, defenses, and offenses, the meaning of oneself and one's existence.

One participant, Robert Jungk, suggests that much of our planning and hopes for environmental amelioration is being blocked by our wartime economy, but no one seems to have considered the implication of our vast space program to our sense of purpose (if we have such) or on our reserves of rare materials so necessary to many phases of the technology we seem to be counting on. This is a finite planet, and while it may be well to compare our space program to the building of pyramids as a symbol of unity and purpose, we must remember that we are not only expending treasure, we are wasting irreplaceable materials on gadgetry we cannot retrieve. The pyramids, at least, provided building materials for later ages, but the rare and valuable materials used in satellites are lost forever. Of course it can be protested that we will bring these back from the moon—and Mars—if they are to be found there, in the fullness of time. But we should get back to earth, and see what the Smithsonian Institution offers us in its symposium volume.

This book appears to be based on a series of formal addresses without commentary, although the purpose of the symposium was "to create relatedness; to relate biologists and anthropologists—students of the human ecosystem—with planners and architects." Unfortunately, the reader must bring the ideas together for himself. At least there is no overlap of dramatis personae between this and the M.I.T. symposium, and all the contributors are unequivocally on the side of the angels. Such well-known partisans as Paul Goodman, Ian McHarg, René Dubos, and Leo Marx have been gathered together with some less familiar recruits from overseas, who remind us that environmental deterioration is not a peculiarly American disease. As Dillon Ripley says in the opening statement, there is public realization that "something is somehow wrong with man's relations with his environment."

And so there is, and whether these books are all widely read or not, sooner or later many of the ideas expressed in them will percolate further into the general consciousness, for ours is the era of concern about environment. It may be debatable whether we have reached the stage hoped for by Shaler, the end of barbarism. Still, it is encouraging to note that more than 80 congressmen are members of Congressman Ottinger's Ad Hoc Committee on Environmental Quality, and we may yet see the day when the attitudes associated with such worthies as Congressman Aspinall and the Colorado River Association are at last out of style altogether. But we have little time; today's environment will be tomorrow's lost Utopia unless we take more seriously such suggestions as that of Harvey Brooks that we should spend perhaps 10 percent of our gross national product, or some $80 billion, to improve our environment [*Science* **163**, 1179 (1969)]. Almost in the same week we find newspaper stories to the effect that the model cities program may be abandoned because it would cost $27 billion in five years. It may not be a good program—few of our city redevelopment schemes satisfy everyone these days—but we are tempted to agree with Whyte that, right or wrong, we should start to do something. Possibly it would be better, as Dasmann suggests, to lay out new cities or expand a few large towns. But whatever is to be done money cannot be the main consideration, for time is of the essence when population, pavements, and pollution are increasing exponentially.

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The Scientific Enterprise

Public Knowledge. An Essay Concerning the Social Dimension of Science. J. M. ZIMAN. Cambridge University Press, New York, 1968. xii + 154 pp. Cloth, $3.95; paper, $1.95.

"Science" is a dirty word, scientifically speaking—imprecise, vague, and only subjectively definable. Science is variously described as a body of knowledge, a methodology, a philosophy, an attitude, a mystique, even a religion. Its component disciplines and subdisciplines have different views of what constitutes "good" science, depending on their respective stages of development.

The vast majority of professional practitioners of science couldn't care less about delineating it specifically. Having been educated and trained in their particular fields, and being accepted as professional physicists, chemists, biologists, or what have you, they have a conviction that what they are doing in the practice of their profession is "science" and an intuitive feeling about what constitutes good, bad, or indifferent work in their fields. They consider the broader aspects of the "system" and their interaction with it only when they become indignant at some breakdown in it, such as a failure to accept them into the in-group, rejection of what they consider to be a good paper, or unnecessary difficulty in retrieval of information from the many sources normally available. But they regard introspection as to the nature of science and the structure of its institutions as a waste of their time—something to be left to the philosophers, sociologists, and historians.

This situation is now changing. The so-called publication explosion, the enormous expansion in the number of practicing scientists and in the total cost of scientific research, and the increasing involvement of science with public issues have placed great strains on the normal functioning of scientists —on their institutions, their techniques for formal and informal communication, their training, their relations to the general public. Confronted by a plethora of glib, half-baked, and often drastic solutions to these difficulties, scientists are being forced to examine their institutions and to ponder over what aspects of the established system are good and worth preserving, what aspects could stand improvement, and how these improvements could be effected.

For this reason Ziman's book is particularly timely. As a research physicist, with a direct involvement in the various phases of scientific work and with a long-standing interest in the nature of science, he has brought a great deal of insight to the study of the system. After some introductory chapters summarizing current views on what constitutes science (and nonscience), he sets forth and develops the point of view that science is "public knowledge" —that is, a body of knowledge (facts, techniques, and concepts) that has been generated by members of a scientific community and, through a process of exchange, criticism, refinement, filtration, distillation, become part of a "public consensus." In elaboration of this point of view, he studies the "social dimension" of this scientific community —the education and training of scientists, the relation of the individual scientist to the scientific community, the varieties of informal and formal communication within science, and the relation of scientists to the institutions which employ them.

What comes through is a sense of the orderliness in the accumulation of scientific knowledge, in spite of the complexity of the processes involved. One sees the extent to which a scientist is affected by the attitudes he absorbs in the educational and training period, the functions of the various kinds of informal communication, the refinements that take place in the transition from informal communication to the archival literature and eventual absorption into the "consensus."

The development of these topics in the book is clear and well organized. It reads very smoothly, and only the reader who has himself tried to put similar ideas into words will appreciate the difficulty of the undertaking and the thought and care that Ziman must have spent to achieve this well-balanced, orderly exposition. Scientists, particularly those in the physical sciences, will find few statements with which they will disagree. What is presented is, in a sense, a consensus of what the social structure of science is or should be. Exceptions, flaws, and problems are carefully noted, but the general structure is kept firmly in sight throughout.

Partly because of this, what one misses in reading the book is the sense of science and its social structure as a dynamic, evolving mechanism, with continuing ferment and change in its institutions and communication channels and even in its overall relative values. Ziman presents the social structure of science as it has been in recent years, not as it was even 30 years ago or as what it will become. There is an element of complacency in the discussion, in that what is good is played up and what is bad (and getting worse) is dismissed somewhat too lightly. Little note is taken of the acute indigestion afflicting many fields of science today. Little emphasis is placed on the revolutionary advances in computer technology, printing methods, and duplicating techniques, or on the growing interaction of science with the general community. There is no mention of the current trend, in science as elsewhere, to challenge the Establishment, to propose radical changes, and to demand validation of current traditions and procedures.

In the area of scientific communication, for example, questions and proposals of the following sort are being debated, with considerable heat:

1) Has the traditional archival medium, the research journal, outlived its usefulness? Will it (or should it) be replaced by a vast collection of documents (refereed or otherwise), with only titles and abstracts receiving wide circulation? Can the input to such a collection receive adequate quality control in the form of refereeing and rejection or forced revision, or will every user have to do his own filtering?

2) Will "hard copy" research journals be replaced by computer stores able, by virtue of detailed classification of subject matter, to retrieve and supply appropriate papers by matching individual readers' subject-interest profiles or in response to suitably framed questions? Or should the research journals be retained, and be supplemented with smaller packages of bound "instant reprints" dealing with closely related subject matter, to which individual readers could subscribe?

3) Should the "invisible colleges" be made visible by making available, as an