Whose Is the Fight for Nature ? by Hugh Iltis

Editor's note: This article is from a prescient paper first delivered over thirty years ago, at the 13th Annual Symposium of the Missouri Botanical Garden on Systematic Biology, Washington University, St. Louis, MO 1 October 1966. It subsequently ran in Sierra Club Bulletin, 10-67, was adapted for BioScience, 12-67 and re-published in Wild Earth some 30 years later.

Academic biology twenty years ago was largely untouched by concern for the preservation of Nature, and a student could go through graduate school without knowing that a serious problem existed. After all, in 1950 the weekly net population increase in the world was only 700,000 individuals. In 1966, it was about 1,300,000; and by 1980, only 13 fateful years away, it will be close to 2,000,000 individuals- *each week two million additional human beings* will need food and space, will bend Nature to their human needs, and will set about exterminating countless species of plants and animals with a ferocity that only the human species is capable of. It must be clear to all but the blindest of evolutionary optimists that the biological problem of man in Nature is now much more complex and that every day brings greater urgency to deal with it.

I want to discuss some of the fundamental reasons for Nature preservation in the world. These are but rarely discussed, although they include the most basic of motivations ever to slumber in the hearts of men; mostly they have been either ignored or ridiculed, sometimes even by scientists who should know better. Their proper appreciation will not only vitalize our own efforts, but provide a powerful platform for rallying the indispensable public support without which all conservation is bound to fail. I shall discuss a platform based on the understanding of human evolution and its meaning to conservation. It is here that the best arguments against blind technological progress may be found and it is here that biologists can find logic to support their inherent love for Nature.

THE PROMISES OF TECHNOLOGY – A DECEPTIVE HEAVEN

Technology has promised us a post-evolutionary heaven in which wild Nature has but a very minor role. Molecular biology, too, has gleeful visions of genetic manipulations of DNA which would change the face of all creation and recast man into a “perfect” image. Others dream about a cheerful if dull world with unlimited opportunity for at least 40 billion people. But any one of us, if not blind, who has hunted for prairie flowers in Illinois, or gone exploring in the Peruvian Andes or on the Mexican Plateau, or tried to find a tree growing in Brooklyn, knows that life's diversity is threatened with imminent destruction, that in twenty or thirty years it will be all but over for this exuberant biotic wealth. The crisis for all the living is here and now. The world of the future threatens to be without flowers, without animals, almost without life except for masses of people. In the next century, in a nightmare world of steel and concrete, of algae steaks and yeast pies, the day may well come when our great-grandchildren will hold hands in a circle and sing

“Spring has sprung
the grass has ris
I wonder where the flowers is”

and wish they could see some.

Population problems

Is there anyone among us who would like to live in such a world ? Would anyone among us not agree that, to remain human, man needs a good portion of wild Nature to walk in, to cherish, to love? Indeed, we all love flowers and birds, and we seemingly must, through some inner unexplained urge, go exploring for plants and find Nature, even if only in a botanical garden. But it is not enough to say that “we need,” that “we love.” The skeptics want to know “why?” and the despoilers of Nature, the technicians of utility, are not impressed by sentiment, but rather by dollars and profit, board feet, and

yield per acre. How can we biologists defend sanctuaries for prairie flowers and "song" birds and Mountain Lions and Pitcher Plants? How can we defend wild Nature for reasons other than scientific use, including intrinsic species interest or maintenance of diversity to insure a degree of stability against the dangers of "one-crop" technologies? Can we defend, in short, a truly human environment for purely human reasons?

Humans in Nature as a Genetic Relationship

Let us try to define a human environment, one in which humankind could find maximal fulfillment. May we not say that the best human environment is one in which the human animal can have maximum contact with the type of natural environment in which it evolved and for which it is genetically adapted without sacrificing the major advantages of civilization; that is, does not the optimum modern human environment require a compromise between our genetic heritage, which we cannot deny, and the fruits of civilization, which we are loath to give up?

Physically, as any animal species evolved in the tropics, we are fundamentally adapted to wild tropical or subtropical habitats; but culturally, especially away from the equatorial regions, we are dependent on towns and cities and adapted to them. Thus, even though we live in houses for our physical well-being, Nature must be thought of as an indispensable biological need in our daily life. Every basic adaptation of the human body, be it the ear, the eye, the brain, yes, even our psyche, demands for proper functioning access to an environment similar, at least, to the one in which these structures evolved through natural selection over the past 100 million years. For millions of generations, as George Gaylord Simpson points out, any of our monkey ancestors whose faulty vision caused them to miss the branches they jumped for fell to the ground and failed to become our ancestors. Only those who were adapted contributed to our gene pool.

We who are Darwin's grandchildren, can thus easily appreciate that, like the need for love, *the need for Nature, the need for its diversity and beauty, has a genetic basis*. We cannot reject Nature from our lives because we cannot change our genes. That must be why we, citified and clothed apes though we are, continually try to bring Nature into our civilized lives, yet without any real understanding of why we do so. We have flower pots and pedigreed pets in our homes, members of the "Plasticales" in our banks, and even in our airplanes "puke bags" with green beech leaves imprinted on the side to make us feel better, to alleviate boredom or sickness by tending to our largely genetically based appreciation of natural beauty.

In contrast, spend a week in the downtown heart of a metropolis, with all its noise, stench, and congestion. No "natural" selection equipped us humans for such insults to the senses, excepts that in the past 100,000 years we have probably degenerated: in comparison to our ancestors we have poorer powers of sight and smell, less sensitive ears, and much less hair. Someday, if we are not careful, through city selected degeneration, the 40 billion members of half-deaf, half- blind *Homo post-sapiens* will lead a life resembling that of termites. Then, even if high quality natural environments survive somewhere by accident, our descendants may not be able to appreciate them.

This is not what we ought to want! Yet the beginnings are here at our very doorsteps. Is not the initial wreckage of such selection already crowding our mental hospitals? Interestingly, in the last ten years several states have tried group camping with the mentally ill, using contact with the out-of-doors as psychotherapy. During the past four years, for example, the Maryland Department of Mental Hygiene took 90 chronically ill patients from the state hospitals to a summer camp for two weeks of standard camp activities. The patients, 40 to 60 years old, had been hospitalized for two to thirty years. In the camp the most unexpected changes took place. Some schizophrenics spoke for the first time in five years ! Perhaps because of innate needs for unfenced freedom (the first words uttered by one patient after years of silence: "This is freedom!"). Significantly for the field botanist, hiking and Nature study became the most popular activities aside from eating. Following the camp experience, 41 of the 90 patients were able to leave the hospital within three months. Despite great difficulties, efforts have been initiated to buy wildlands for such a camp in Maryland; hopefully this will be done in other states

as well. To us, as botanists and conservationists, this should be an encouraging sign, a hopeful rebirth of sanity, a reawakening to the human values of wild land.

Nature in Humans as a Cultural Force

Separated from Nature, the human animal as a biological unit is in most ways a meaningless bundle of adaptations. Similarly, humans as a cultural force cannot be understood without their landscape. Today, as never before, there is an overriding urgency to awake in time to prevent the permanent subjugation and extinction of the living landscape, whether wild and free or farmed in a nonintensive way.

Senator Ingalls of Kansas said some eighty years ago, "Give the philosopher a handful of soil, the mean annual temperature and rainfall, and his analysis would enable him to predict with absolute certainty the characteristics of the nation."

Today we ignore this basic truth. In this overly rich country, we now worship the high standard of living, but we forget that ultimately it arises in the land. We credit scientific advances, the pioneer spirit, and democratic institutions with our great agricultural wealth in the Midwest, but often neglect to mention that due to an accident of Nature we have some of the richest farm soils in the world.

Until thirty years ago, we identified closely with the pioneers, their hardships and devotion, their environment of hostile Indians and waving grass, of cattle and cowboys. The prairie was their garden in more than one way! The six feet of topsoil, the magnificence of millions of Buffalo, the sweat of breaking the sod, and the harvest of vast yellow fields of wheat are part and parcel of our history. Without the prairie or the forest we, the American people, cannot understand where we came from, what we are, or where we are going. Yet today the prairies and the forests have largely been killed, and thousands of species, especially of the prairie flora, are on the verge of extinction. By our own avarice, we are losing touch not only with our biology but with our history and with our culture. Meanwhile, our technological cheerleaders are urging us on to more intense utilization with resultant greater destruction, both here and in underdeveloped countries- all this with the blessings of many a thoughtless scientist, who can think only of his specialty and the good safe problems of years ago, and with the unqualified approval of most economists, who can dream only of expanding economies and the stock market.

Does all this really matter? Surely our technology may keep us rich and abundant; but will it keep us human? Will it satisfy the simple and vast unspoken needs of humanity, the need to keep in touch with its ancestry and the need to live a biologically and culturally meaningful life?

The original landscape as it was before the settlers came is still vitally important to our educational process. We need fenceless wild lands to know how our forebears lived and worked. We need wilderness to know where we, the human species, came from. Yet we are rapidly becoming cultural and evolutionary orphans- a people without a past, a species out of context.

Whether we are concerned with such basic biological or cultural considerations, or show concern for preservation because of some immediate or long-range economic or ethical concerns, the fundamental relationship of humans to Nature must be clearly understood. **It should never be forgotten that this is the only living world, the only flora and fauna, that you and I and our children will ever have**. It must not be forgotten that we are now being given our *last chance* to preserve even bits and pieces of our biotic environment, the last chance to save our flowers and birds and fish.

THE SOCIAL RESPONSIBILITY OF SYSTEMATIC BIOLOGY

But whose responsibility is this preservation ? Who should take the first step to deflect the technological tide? Some of my scientific friends tell me that botanists are not, as I charge, irresponsible in their lack of concern for preservation, because, they say, such concern is simply not their responsibility! They are scientists, not conservationists. Preservation, they say, is a public and

political and moral problem (which is indeed true), and that it therefore lies in the province of the politician and the voting citizen. It is not, they say, the scientist's (more specifically the taxonomist's) duty to get involved as a scientist but only as a human being. This, I submit, is perniciously false: chemists, physiologists, agriculturalists, in fact most professional biologists generally don't know an *Astragalus* from a *Zinnia* ! And neither do they much care, if they think about this at all. What is a tropical forest but potential lumber, a prairie but a potential cornfield? If there is anybody who should provide leadership in the preservation movement, it is the systematic and environmental biologists, you and I.

As citizens and humans, each with individual desires, as trained taxonomists or ecologists, each perhaps wishing to preserve the particular organisms with which he works, we are the only ones in any position who know the kinds, the abundance, and the geography of life which cries for preservation. This is a knowledge with vast implications for mankind, and therefore vast responsibilities. When nobody else knows, *we know* where the wild and significant areas are, *we know* what needs to be saved and why, and only *we know* what is threatened with extinction. *We are responsible*, because we know, and because we love. When the Amazonian rainforests or the world's grasslands have all fallen total prey to the gods of economic development and to the devils of human stupidity, no one will care to ask "Who was responsible?" But, in fact, we shall all have been guilty! Let us then paraphrase the old Talmudic questions: If not we, who shall speak for the flowers? If not now, when?

The irresponsibility of Biology

But the record of the taxonomist is far from perfect ! Many of us are asocial, often insecure introverts: timid, apathetic, self-centered, and a bit ashamed for caring what happens to flowers. Perhaps we enter botany because we *are* peculiar people. "You don't have to be crazy to be a taxonomist but it sure helps!" Jack Sharp used to say. Edgar Anderson once quipped in provocation, "You know what taxonomists are? Taxonomists are mice hiding behind herbarium cases hating each other."

Do we deserve such sarcasm? Yes, indeed! How do we use our convictions? Where are we botanists when the going gets rough, as, for example, when our wild lands go on the economic auction block and become part of the Gross National Product? Where is there a botanical group to protest our Gross National Destruction?

Does the Botanical Society of America have a committee on conservation? It does not![1] What about the American Society of Plant Taxonomists? No, indeed! And neither does the International Society of Plant Taxonomy, nor the Society for the Study of Evolution? Shouldn't these groups, at least, show their concern? What will we taxonomists and evolutionists study when cows and corn dominate the earth?

Except as members of the Ecological Society, do we botanists send representatives to the Wilderness or Pesticide Bill hearings? Why, no! Most of us do not even send letters defending our views. Surely this is not from cowardice, and doubtfully from indolence or pressure of other duties. If botanists, or especially systematists, do not get the public's confidence, it is as much their fault as that of anyone else. For all that Congress and the American people know, botanists don't exist, much less care.

The consequences of this apathy is disastrous! For the opposition is always there in force, including lawyers and lobbyists, and all the members of "academia" involved in that gray area of consulting and advising the vested interests; foresters and cattlemen, bacteriologists and economists, geologists and entomologists, all have their say.

By default, by indifference, or by unintentional cooperation, we *give* almost all the victories to the exploiters, who superbly organized, have money to burn, talk "common sense" in doctored press

1 As a consequence of A.J. Sharp's thoughtful speech at the 1966 AIBS Annual Meetings, the current president of the American Botanical Society, Dr. Harold Bold, has appointed, finally, a Conservation Committee.

releases, and have as allies a vast number of underlings, in and out of universities, in and out of government, who can hardly be expected to bite the hands that feed them. Some day, when it will be far too late for the issues to matter much, the history of the "Silent Spring" controversy of the early 1960s will be written, as well as that of the shameful and cowardly role of much of biology and the blindness of most of agriculture. It will be nothing for us to be proud of.

In botany courses of most universities we teach about the birds and the bees and DNA, but we are noncommittal about their human and ecological implications. By our silence, we perpetuate the pernicious falsehood that science has nothing to say about ethical values. We acquiesce to silencing and censorship by university deans and reap a moral "Silent Spring." *Through collusion or indifference, we biologists are thus losing not only our self-respect but also what could be our strongest ally: a well-informed and aroused public.* As a matter of fact, it is the public which, taking the initiative, often forces *us* to take a stand in the interest of man. It is a strange and sad paradox that most contemporary botanists should require propaganda to persuade them to initiate or even support political measures assuring some survival of biotic communities, and thus a healthy human environment. Yet so it is.

What about our leaders of the American "Botanical Establishment," many of them graying heads in the National Academy of Sciences? Surely they, in their wisdom, must see that the living world is breaking apart at the seems. Surely they should feel a moral and cultural obligation to voice their concern to their profession and to the public over the extinction of species, the loss of major plant formations, and the horrible destruction of life in the tropics, the last often in the name of U.S. foreign aid or the United Nations? Let me hasten to assure you that (except for the likes of G. L. Stebbins, Jr.) if they have some understanding or concern, they do not show it.

All botanists should read the 167-page report by the National Academy of Sciences- National Research Council (Publ. 1405, 1966) "The Plant Sciences Now and in the Coming Decade, a report on the status, trends, and requirements of plant sciences in the United States." For the next 10 years, an expenditure of some 1500 million dollars is recommended for the botanical sciences- 150 million a year! In the fields of taxonomy, paleobotany, and plant geography, the report generously recommends 49 million dollars for general research and training support, and another 35.3 million dollars for special projects and equipment in the next decade. It signals a bright future for numerical taxonomy and for "DNA taxonomy," and nearly a third of the total 84.3 million dollars is most laudably suggested for the acquisition or development of botanical gardens. Although admittedly this was not in the charge to the committee that wrote the report, **not one cent is recommended for the acquisition and preservation of natural areas!** Not one cent out of 1500 million dollars! Surely, this is blindness! Surely, the authors must know that land for learning is rapidly disappearing. The slant of the whole report is clear; molecular biology is the overwhelming theme, and increased agricultural production the background music; ecology has no score of its own, it must take its chances with physiology. Yet, how are we to teach taxonomy or ecology 20 or 40 years from now? This report gives lip service to conservation in but three places, for a total of twelve line, with obscure recommendations that species about to become extinct should be salvaged into cultivation. Surely, the authors must know that most plants or animals cannot be brought into cultivation divorced from their ecosystems, and that soon the gardens of the world would not be big enough to hold all the plant species that are being destroyed by man.

Reading this botanical report of the NAS-NRC we can see that these mostly highly conservative scientists are fascinated with the latest of fads, molecular biology. They do not wish to realize that the world's ills are ethical consequences of ecological issues! They were asked to report on science, and that they did. From reading this it would never be guessed that in the larger longer view the most crucial botanical problem of the next 10,000 years will be the human habitat and its conservation.

Conservation is not so much a science as an ecological point of view, a morality, an ethics inseparably linked to the science of biology and to human welfare. Intelligent politicians like Senator Gaylord Nelson of Wisconsin are beginning to recognize this morality and to introduce appropriate

legislation.[2] Although some problems of food production might be temporarily solved, they know that *the fundamental issue for the human species is not going to be the quantity, but the quality, of life.* What sort of life will man, the animal species *Homo Sapiens*, lead? Here again, as so often in the universe, those who have a new viewpoint of man's role in the universe, who now worry about a "land ethics" and a "conservational conscience," have to appeal to the public directly and bypass the entrenched administrative and scientific oligarchy.

The taxonoimist's role should then be clear: he must use part of his energies to educate the public. In this he should feel assured that this is a good period in which to become involved. Vast changes have taken place in conservation in the last 10 years. Destruction is accelerating, but so is biological understanding and efforts for preservation. The many books, from Aldo Leopold's classic *Sand County Almanac* to the recent works by U.S. Supreme Court Justice Douglas on the legal aspects of American conservation and by Secretary Udall on its historical aspects, are encouraging signs. Pleas for natural areas appear now even in *BioScience*! The increased influence of the Wilderness Society, the Sierra Club, the Nature Conservancy, the Audubon Society, and others points to an increased public realization that man needs the wilderness.[3]

Recently, Garrett Hardin noted the two most significant publications in biology in the last decade: Watson and Crick's paper on the chemical basis of hereditary material, which ushered in the newest era, that of molecular biology; and Rachel Carson's Silent Spring, which forever shook our optimistic blind faith in Science, and, for the first time in history, thrust upon biologists their awesome but inescapable social responsibilities.

Preservation thus starts with your own small efforts. The influence each one of you can have is enormous! What can you do ? What must you do ?

1) Even if you are not a joiner, join the two or three national conservation organizations and one or two local groups that are to your liking. Without political implementation all our understanding will be to no avail. You have to rack the conservational boat to make any political ripples.
2) In your local area get at least one project underway, not just for the sake of the land preserved, but as an educational vehicle for the public. For, in the last analysis, only an educated public can insure our children a rich world. It is in the process of saving 40 acres of maple forest or 3 miles of abandoned railroad prairie that you can reach a thousand citizens, and teach, teach, teach!
3) Instruct your students by example! *There should not be a student who doesn't witness the unashamed involvement of his teacher in the conservation of nature*. There should not be a student graduating in biology who has not read Aldo Leopold's Sand County Almanac or Rachel Carson's Silent Spring, or who has not become aware of what the scientific and social issues are. The time is so short (specifically, the next decade) that a clear exposition of the issues from a biological-ecological viewpoint is crucial. One more generation of biologists, blind to their ecological responsibilities, will be one too many.
4) You need to keep watch of a major trend in national and state parks in this country which can have disastrous consequences; namely, the efforts, under tremendous pressure from the public and from vested interests, to turn these into giant amusement parks and picnic grounds. The controversies over the proposed Smoky Mountain National Park trans mountain road and the Grand Canyon dams instance but two such efforts, and the end of such perversion is not in sight.
5) Mostly through United States and Russian leadership, and with good intentions, western civilization is introducing its type of land exploitation in the underdeveloped countries, too

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2 For example, the important "Ecological Research and Surveys Bill" (S. 2282 of the 89th Congress) or recent efforts to ban nondegradable pesticides.

3 Yes, even the National Academy of Sciences has come out strongly for control of environmental destruction, for "Restoring the Quality of our Environment", and for increased "Waste Management Control " (Report of the Environmental Pollution Panel of the President's Science Advisory Committee, November 1965, and National Research Council Report No. 1400, 1966.)

often accompanied by doubtful blessings. Should we botanists, in our state universities and with out legislators, not demand that ecologists and taxonomists always be found among those sent to direct such introduction? Should we not at least question the use of 2-4D to kill thousands of square miles of tropical forest, thereby destroying their tremendous gene pools, only to replace them with mono-plantations of *Eucalyptus*? Should we not ask ourselves whether the prevention of the destruction of the remaining tropical wilderness and the *preservation of primitive tropical agriculture* are not our responsibilities? Edgar Anderson and Carl Sauer have long pointed out that we have much to learn from primitive peoples and their ways. Are we, in our Western arrogance, destined to be those to destroy durable agricultural systems and invaluable genes?

6) And finally, speak out! If you are housed in the no-longer-so-ivory towers of a university, you have doubtfully more to lose than than a raise, but everything else, including the respect of your students, to gain. If you are less sheltered, you may have to risk more, but by your silence you will risk immeasureably greater loss for yourselves, for your children, and for society generally. You must demand the right to say what you believe and to defend what you know to be right. Fight for life, biologists! The time is so short.

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We who understand that the basis of human culture lies in the past, we who believe that man does not live by bread alone, must pledge our conservation ideals with concrete action. That our prairies and our forests, yes, and our deserts and our waters, shall survive and thrive, is our responsibility. That these wild lands shall live and bloom for 10,000 years to come is our dedication to human culture, and its fruition our most precious legacy to our children; so that they on a warm day, can feel peace in a sea of grass, watch a bee visit a shooting star, hear a sand-piper call high in the sky, and marvel at the incomprehensible symphony of life.

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Postscript

Today, my 31-year-old manuscript does not seem much out of date. After all, “We are still marching in the streets with little victories and big defeats,” (Joan Baez) empowered by an enormous increase in ecological and biodiversity understnding, yet defeated by a continuing shrinking of ecosystems and extinctions of species, on a global scale. It is this that our enemies in the multinational corporations, in the labor unions, in the World Bank or the USFS cannot understand – that we fight for the good wild Earth because we love its diverse and lovely face, and are morning the loss of the irreplaceable. And in the meanwhile, shielded by greed, hunger, and the arrogance and ignorance of those in power, the population tidal wave is heading inland – nearly 2500 million (!) more human beings since that week in September 1966, when I sat down to write that sermon to my fellow biologists and to the National Research Council for ignoring ecological realities. It took fully 20 years before that august establishment (under the prodding of Walter Rosen and his coining of a new word for a very old

* Flora de Manantlan by J. Antonio Vazquez G., Ramon Cuevas G., Theodore S. Cochrane, Hugh H. Iltis, Francisco J. Santana M., and Luis Guzman H; 1995

concept – 'biodiversity') held an important conference in Washington, and finally gave *biodiversity* its due. Who knows- if we all work as hard at educating the public as Wild Earth, we may, with luck, turn things around in another 20 years. Thanks for this resurrection, from your old (now 72!) pessimistic optimist. - Hugh Iltis