

Shepherds Leading Sheep to Slaughter

The Biology Teacher and Man's Mad and Final War on Nature

By HUGH H. ILTIS

• First part of a two-part article. The extensive references, including those cited here, will appear with the remaining text, in April. At that time, too, the significance of the italic line in the title will be more strongly apparent.

Walking the crowded streets of Chicago on the first morning of the NABT convention, I picked one of Mayor Daley's plastic flowers and wished for a few real ones. I also wished for fewer people and cars. After all, the topic of my address to the convention, and one of the main concerns of NABT, as it ought to be for all men, was the people-environment equation. And there is no better place in the world to perceive the staggering imbalance so typical of modern civilization than downtown Chicago.

I was reminded of a comment by Marston Bates (1955), to this effect: Human population growth is like cancer. The yearly annual increase is now about

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70 million, or 6 million a month—the equivalent of the population of Chicago. And whatever one may think of Chicago, a new one every month seems a little excessive.

Excessive, too, is the general unawareness of the significance of all the environmental turmoil: the popular view that, on the one hand, man can somehow adapt to pollution and crowding and, on the other hand, that he can solve his environmental problems solely by relying on technologic advances.

In a cartoon in *Look* magazine (Flagler, 1971) two businessmen are walking down Fifth Avenue with their attaché cases; one is saying to the other: "The way I look at it, there's a price tag on everything. You want a high standard of living, you settle for a low quality of life." The irony here may not be lost on you, but it seems to have been missed by many economists and sociologists. Indeed, even Philip Hauser, the eminent demographer at the University of Chicago, seems to see nothing particularly incongruous about giving up a biologically rich and humanly decent environment for one with increased urbanization and all that that implies—and using almost the identical language of that cartoon to do so! He said, in an interview:

The romantic nostalgia that some town and country planners have espoused is utter nonsense. Ferdinand the Bull sitting under the trees and smelling the pretty flowers just won't work in the modern world of the present or the future. This could be accomplished only at the expense of lower productivity and lower levels of living. (Hess, 1971)

But the problem of man and nature cannot be so cavalierly and sarcastically dismissed. Like so many

physicists, chemists, and sociologists, Hauser shows an unfortunate misunderstanding of the nature of human biologic conditions (cf. Etzioni, 1970). It is this kind of misunderstanding that allows, for example, the construction, in Chicago, of a nine-storey high school building for 3,000 students—without *any* windows. It is this kind of misunderstanding that urges irrigation of the Sahara and destruction of the Amazonian rain forest (Tobin, 1970). It is this kind of misunderstanding that points up the modern problem of man's inescapable genetic needs, frustrated to madness in the giant city, and of man's optimum environment being destroyed before his very eyes (Iltis, 1966, 1968; Iltis, Loucks, and Andrews, 1970).

The French sociologist-theologian Jacques Ellul put it well in his masterpiece, *The Technological Society* (1954, p. 325):

The milieu in which man now lives is no longer his. He must adapt himself, as though the world were new, into a universe for which he was not created. . . . He was made to have contact with living things, and he lives in a world of stone.

A Special Responsibility

Exacerbated by the population explosion, the technologic revolution has produced an inevitable and unprecedented environmental crisis, which thrusts the biology teacher, especially, into a position of crucial responsibility and fateful power. Who among you would have dreamed, not so many years ago, when you were catching your first frog or picking your first flower, that the very survival of beast and flower, as well as of man and civilization as we know it, would depend on the biology teachers the world over? For no chemist or sociologist, no senator or president, can understand biology as well as you do or is able to defend the living world as effectively.

Look at it as one may, there is no technologic fix, no political panacea, that will extricate us from the environmental crisis—but your insights from biology, together with the acceptance of evolution and ecology by your students and by the population at large, just possibly might.

Indeed, only the biologists can lead a sick, confused world back to health. Take just one example: the training of medical doctors. Biologists are the ones who will teach evolution and ecology to the medical students, who are the very ones who will be acting as human ecologists all over the world. Not only that: *your* presentation will be the *only* one in which these future M.D.s will ever hear of evolution, of diversity—and, I hope, of beauty and wonder as well—and of the long and tortuous winnowing and sifting of natural selection, which produced man and mouse alike. If medical students have a good understanding of evolution, they will become a potent force for human good; if they lack it, they will continue to prepare the world for disaster.

(Allow me an aside. The moral obligation of biology teachers is to teach biology, to teach of the fabric of life. And more and more it becomes apparent that

every teacher has an obligation to spend a summer at a field station to learn what to teach youngsters about this fabric of life and to be able to answer the searching questions of the young. If you don't understand why this is so crucial, then either quit—or else go forth and learn field biology!)

Politics and the Environment

With all the concern for environmental teaching in *American Biology Teacher*, two topics are covered by thunderous silence; namely, politics and extinction. Concerning politics, two things must be obvious to anyone who is sensitive to the environment:

1. Continued development and economic growth are one thing; preservation of the environment and steady-state ecology are another. It should be quite clear that, for the most part, *preservation and development are two mutually exclusive concepts*. You can't eat your cake and have it too; you cannot get something for nothing. These are two clichés, to be sure, but they represent the most fundamental of ecologic laws. Prudence, therefore, would dictate that choices today be immediately redirected toward long-range aims: more outright preservation and strictest restraint in using resources. This is what Earth Day is all about. This is what ecologists and everyone must expect from intelligent and responsible leaders.

2. The present leadership of the United States refuses to accept this or any other ecologic law. Lip service notwithstanding, the political, financial, and military power structure, including the present administration, is primarily committed to those exploitative industrial interests that wish to make big money at all costs, and not to those that wish to protect the environment and its ecosystems. Consider the evidence:

We are still at war—80 billion dollars' worth a year—and not at peace.

We are still waiting for the five-year birth-control program demanded of HEW by Congress, and we still do not have, nationwide, liberal abortion and birth-control laws.

We are still dragging our feet on pollution, and the 20 billion dollars a year it will take in each of the next five years merely to clean up past messes is not forthcoming.

We are still, as a nation, not committed to the absolute necessity of recycling.

We are still squandering resources as if they had no end, are destroying large and magnificent parts of the earth to get or grow them, and are encouraging and even bribing other nations, especially the underdeveloped, to copy our environmental insanities.

And the administration does not really care. It shows no signs of earnestly committing itself to the solution of the overwhelmingly serious ecologic and social problems of today. In fact, the anti-environmental mood in the administration is becoming

stronger. It was most clearly reflected by the President himself in his appearance before the 5,000 members of the Detroit Economic Club, on 23 September 1971. The industrialists there loved him, particularly when he talked reverently about profits. They loved him even more when he promised them, in brazen sincerity, that "We are not going to allow the environment issue to be used in a demagogic way to destroy the industrial system that made this great country" (Nixon, 1971). No wonder they applauded wildly! Free license to continue to exploit, to develop: how nice for them! But how bad for us—and for them and their families, too, in the not-so-remote future.

Subverters of the Movement

The President's comments are only too typical of an insidiously innocent but dangerous tendency gaining momentum: the current counterrevolution against the environmental movement. The cynical denigration of the ecologist, the continual bombardment of the public by misleading advertisements in magazines and newspapers, the deliberate circumvention of laws by managers and officials, the naïve cornucopic pronouncements of the technologic bamboozlers such as Buckminster Fuller (1971) and Constantinos Doxiadis, of many, often well-meaning, scientific experts such as Philip Handler (1971) of the National Academy, Alvin Weinberg (1970) of AEC, Athelstan Spilhaus of AAAS, and Nobel laureate Norman Borlaug, and of such agencies as FAO (Tobin, 1971)—all these and, unfortunately, many others have contributed towards a simplistic assessment of the crisis. All these are pushing "progress," "growth," "food production," and the sweet nonsense that we can have both unlimited development and adequate preservation.

For how long can we afford to be this innocent? What if this madness lures us out on the slender limb of biotic simplicity from which there is no retreat, but only the inevitable collapse of the ecosystem? For how long can we afford to listen to so many biologically innocent "experts," whose pontifications will cost us the extinction of biotic diversity? What if the diversity of life continues to become less and less and the options for sound ecomanagement thus become fewer? *What if, in fact, these experts are all wrong?*

It is indeed no accident that "experts" tend to be the butt of many a joke, and for good reason: they are so wrong so often. The definitions alone (and they are legion) of what an expert is are not only humorous but are often very revealing. What is an expert?

He is a man from out-of-town with slides.

He is a man whose ignorance is superbly organized.

In Marshall McLuhan's definition, he is a man who does not make the slightest error on the road to the grand delusion.

What if unlimited energy, unlimited wealth, unlimited growth, unlimited development, and unlimited

human adaptability prove to be grand delusions, which every ecologist knows they are? What then? Indeed, there are only two things that are unlimited, Einstein said: the universe and human stupidity.

What then, if, as a society, we stumble and make a grand mistake? What if Mr. Nixon is wrong? And what if, in fact, the environment does come first and the industrialist's profit second (Iltis, 1970a)? What if the *only* viable course left to this country is a decrease in the GNP and an enforced limitation of its economic growth?

The Environmental Protection Agency is one of the few federal organizations that tend to take exception to the officially sanctioned policy of economic *laissez-faire*. Its embattled administrators Russell Train, William Ruckelshaus, and Lee Talbot have attempted to do a fine job, but more often than not they are being sabotaged by the White House or the State Department. Thus, in the present administration these men are almost accidental anomalies; and where they have succeeded it was because of public backing—not because of the administration, but in spite of it. This is to these men's great credit; their agency was in part created as an administrative smoke screen for business-as-usual exploitation.

It is good also that we have the courts, where citizens and organizations alike can sue, and are now suing in ever-increasing numbers, as they attempt to insure that both government and industry do the environmentally right, the humanly moral, thing. The decision of Judge J. Skelly Wright and his associates in Calvert Cliffs' Coordinating Committee, Inc., v. Atomic Energy Commission (Wright, 1971) shook that blindly power-mad organization to its very foundations by demanding that it behave responsibly toward the environment.

Yet, all in all, there is little to be optimistic about. Therefore it is of paramount importance for biology teachers to be able to explain to their students precisely why, in spite of efforts and laws to the contrary, the environment is continuing to deteriorate; why we continue to permit short-term profit and long-term disaster; and why solutions are not forthcoming. The answer can be simply stated: the powers that be don't want to lose money. And the powers that be are not very bright, either in their shortsighted, essentially selfish view of economic gain or in their superficial attitude toward the environment.

Nixon's Men-at-Arms

Other factors must be considered, by biologists and citizens alike. What of the character of the men whom we delegate to represent us in government? Biologists, who are supposed to know something of the determinants of behavior, should be concerned when they discover that Secretary of Commerce Maurice Stans enjoys playing the part of a Great White Hunter in Africa. He not only slaughters animals belonging to species that are on the shadow line of extinction but has himself photographed with his

dead quarry as well. Stans, speaking to business leaders attending the Financial Executives Institute held in Houston, Texas, suggested that we must not act in the face of "ecological hysteria" and that environmental risks must be weighed against the national interest (Stans, 1971). The problem, of course, is this: precisely what does he mean by national interest? Does he mean the preservation of an ancient assemblage of natural things, which give joy and meaning to life? Or, perhaps, does he mean the preservation of laissez-faire and a suicidal plunge into materialistic expansionism, which will end only when the last iota of matter has been transformed by economic man into money?

Secretary of the Treasury John Connally is also a great hunter. His African safari after he left the Texas governorship was well covered in all the Texas newspapers, complete with photographs of Connally amid mountains of bleeding flesh. Is this sort of behavior appropriate today? Should people with environmentally destructive hang-ups run the economy of this great country? We could barely put up with this butchery in Teddy Roosevelt's day, when there was much game and fewer people; today, to blast away at sable antelopes or African leopards reflects a moral callousness, an elegant corruptness, or, at best, a blind foolishness that is not lost on our students. To hunt, yes—satisfying, as it does, some very basic and primeval human urges (Tiger, 1970); but to hunt, with such a pathologically acquisitive drive, the rare and vanishing members of this ancient fauna indicates, in the Connally case, that we are being led in the delicate field of international economics by a man whose pattern of existence shows him to be dangerously ignorant. The question, then, is: should such men, who lack any environmental or social commitment except to their own power, be our leaders?

Small wonder, then, that our leaders in government are still talking about putting "economic impact" ahead of "ecologic impact." Says Stans (1971): "Isn't it time for someone to say 'Wait a minute?'" He chides the "vocal" and "impatient" eco-alarmists that jobs are at stake, that plants will be shut down if we enforce the laws too rigidly. He says we need a slowdown on the banning of DDT, of phosphate detergents, of polluting automobile emissions. He says we need to encourage the building of new power plants and off-shore oil-drilling. Would anyone who knows of Stans' propensities in Africa be surprised at these and similar sentiments? And again, should this kind of man have the power that he has?

The one ray of hope in Nixon's cabinet was Walter Hickel, a tough, outspoken, and honest man, who got fired, ostensibly for writing a letter—a thoughtful, courageous letter defending today's disenfranchised college students. Hickel is a self-made Alaskan, who grew in his job almost from the day he arrived in Washington and who threatened to become one of the best secretaries of the Interior and defenders of the public trust since Stewart Udall and Harold Ickes.

That fact alone was intolerable to the President and, especially, to the oil industry. Hickel had to go if exploitation was to stay.

I wish to apologize to Hickel. I fought his appointment bitterly, for he looked like a run-of-the-mill environmental exploiter. But most of his actions as Secretary of the Interior were courageous and reflected a deep concern for nature, a love for the land and its people. When a man can say, as in the case of the California condor controversy, "it was a choice between rare birds and pumping oil, and I chose for the birds"—that is quite something!

Alaskan Oil: Whose Is It?

Unfortunately, both Hickel and his successor, Rogers Morton, support the Alaskan oil pipeline, a project that is clearly an environmental and aesthetic monstrosity. May I suggest to both of these men and to the President, who are all so anxious to have the oil come out of the ground and produce profits, that there is a simple alternate solution to the Alaskan oil problem—a solution that is both ecologically sound and economically prudent. What clearly needs to be done is to *nationalize the Alaskan oilfields* and keep them locked up for 100 years. This action makes sense for the following reasons:

1. We do not need the oil now. But, given our chemical (especially the plastic) industries and our whole highly technologic civilization, so utterly dependent on oil, in 100 years man will be desperately oil-hungry and glad to have this rich field available. The locking-up of these oil reserves is the best kind of wisdom and foresight. It will insure energy and chemical supplies for our grandchildren.

2. The immediate pollution of the Arctic Ocean and of the Alaskan ecosystem is certain to occur if the pipeline is built now. In 100 years, however, we might have the technology to remove the oil without damage.

3. The moratorium will prevent us from sending the oil to Japan, for which most of Alaska's oil is in fact slated. The denial of oil to the booming economy of Japan might, in turn, slow down its insane yet deliberate economic growth and avoid the collision course with the United States on which Japan is inescapably set. We might thus help to prevent World War III.

It is time to defend ecologic right over financial might. The erstwhile Secretary of the Interior has written a most interesting book, *Who Owns America?* (Hickel, 1971). The title impels me to ask: who owns Alaska's Arctic oil? This oil is beneath publicly owned land—a public resource in the public domain. Why then should not the oil be under public ownership and administration for public long-range benefit and use? Surely the oil can wait, safe in the frozen Alaskan ground. Nationalization—the creation of a National Oil Resource Park, if you will—is the answer that makes eminent ecologic sense.

(Concluded on p. 137)

all the right answers indicated. When discussing the exam with them, this saves the time of going over those questions that many students will understand by just seeing which answer was correct. The time saved can be used to explain in more detail an answer to a more complex question. Our exam-review sessions have been far more rewarding because of this feature. Usually the questions that are in need of detailed explanation are those that confused the largest number of students in the class; hence, these explanations reach the greatest number of students who need them.

4. For reviewing at the end of marking periods or semesters the student has all the correct answers already on his answer sheet. A set of exams becomes, in effect, a sort of "programmed" biology course. This will encourage the student to go over his own exams, knowing he has a ready check on his knowledge.

We have been using this system in our biology department for several years. We have found it easy to use and very rewarding. Those who try it will, I am sure, be similarly rewarded.

Science Club

from p. 133

2. The major gas and heated-aerosol polluting agent is automobile exhaust.

3. Under certain conditions automobile exhaust may combine with water and produce weak but effective acids. Thus, corrosion of metals occurs at a greater rate.

4. The shopping center is a major secondary pollution factor, in that asphalt and cement radiate heat, which magnifies existing pollution.

5. Architects and engineers should consider the use of materials that are less heat-retentive. This would reduce some aspects of air pollution.

6. The immediate environs of the shopping center are warmer on cool winter evenings than are the streets farther away. The thermal energy from the shopping complex is effective slightly beyond the 1-km zone.

7. During the summer months rainfall patterns indicate that the high aerosol content and additional atmospheric heating over the center creates an almost constant vertical movement of air. This causes convection showers around the center and a lessening of rainfall over the center.

The biologic studies yielded less information, but the students found that domestic species of plants and animals quickly replace native species. Pesticides and other chemicals probably aid in the removal of native populations, and the more resistant domestic species increase.

The project raised more questions than it answered. Even so, this project proved to be a source of enrichment to the club and the community.

War on Nature

from p. 130

Despite his misguided stand on Alaskan oil, Hickel is a man who has shown great capacity to learn. I wish him well. I hope that he will learn all the ecology and biology that he must; for his is an important voice, which has given both students and biologists, as well as the public, faith that even this government might possibly work or might even change, given an honest man. Abraham Lincoln was made of similar rough stuff, and he became a great president.

We will never get to the root of our environmental crisis by picking up tin cans. Only by changing the very institutions that have allowed our crisis to develop, by placing in high government office men who have an honest concern for ecology, is there hope for plants and animals, and for us, to survive. Let us quickly dismiss from positions of power those who do not understand the ecologic limitations of the earth. Let us replace them with people as environmentally concerned as Ralph Nader, William Ruckelshaus, Gaylord Nelson, Walter Hickel, and Robert Packwood. And let us, as individual biologists, do our utmost to make sure that such men are elected to the highest positions in government.

Let the biology teacher become politically active. Let him join with the Sierra Club, the Environmental Defense Fund, the Wilderness Society, the National Parks Association, and any other organization willing to hire lawyers and fight the smoke screen of the anti-environment campaigns.

The National Association of Biology Teachers must speak out, too. It should hire representatives in Washington—eco-lobbyist lawyers who would represent its members' wishes (Iltis, 1969, 1970b). The issues are not only questions of politics or biology; they are issues of simple human decency. The biology teacher, more than any other professional, has the answers to many of today's problems. You must not remain silent.

(To be concluded in the April issue)

Correction

In the article "A Versatile Copper Reagent for Sugar Chemistry Demonstrations," by F. W. Price (ABT 34 [1]: 23-27) the word "ammonia" was dropped at the beginning of the section on preparing the reagent. The first sentence should read as follows: "To a 5% w/v [weight per volume] aqueous solution of cupric sulfate pentahydrate, $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$, add strong ammonia (S.G. 0.880) from a buret with continual swirling."