

should encourage biology teachers to do a little reviewing on their own. It's an excellent list—as media coordinator of the biology department at Salem College, I make frequent use of it.

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Plans are underway to resume coverage of audiovisuals in ABT. In the meantime, we're pleased to follow your suggestion.—Editor

ACI Films, Great Neck, N.Y. 11020: *City Limits*
Churchill Films, Los Angeles, 90069: *Strip Mine Trip*
Communico Films (address unavailable): *Stream*
Coronet Instructional Films, Chicago 60601: *Adaptation of Birds; Fruit Flies: an Inquiry into Behavior; and The Egg Becomes a Chick*
CRM Educational Films, Del Mar, Calif. 92014: *The Cell: a Functional Structure and Evolution and the Origin of Life*
Dimension Films, Los Angeles 90069: *Buttercup*
Doubleday Multimedia, Santa Ana, Calif. 92706: *Nerve Muscle Preparation and Where the Embryo Grows*
Encyclopedia Britannica Educational Corp., Chicago 60611: *Buffalo: an Ecological Success Story; Cactus; Adaptation for Survival; and The Mayfly: Ecology of an Aquatic Insect*
Harper and Row, New York 10022: *Galapagos: the Experimental Conditions and Redesigning Man: Science and Humanity*
Hartley Production Films, New York 10017: *Darwin Galapagos Today*
International Film Bureau, Chicago 60604: *Waddensea: Bird's Paradise*
Macmillan Films, Mount Vernon, N.Y. 10550: *Oil Sport and Rhythm of Life*
McGraw-Hill Films, New York 10020: *Animals of Africa and Baobab: Portrait of a Tree*
Moody Institute of Science, Whittier, Calif. 90606: *The Human Machine*
National Film Board of Canada, New York 10020: *Beyond the Naked Eye and Keepers of Wildlife*
Oxford Films, New York 10028: *Pond; Swamp; and Desert*
Robert Hartkopf Films (address unavailable): *Cry of the Marsh*
Schloat Productions, Pleasantville, N.Y. 10750: *The Life Cycle of a Flowering Plant*
Windrose-Dumont-Time (address unavailable): *Survival and the Senses; Too Many Elephants; and How Animals Speak*

THE LIFEBOAT ETHIC

● At the 1974 NABT convention Garrett Hardin spoke on the topic "Spaceship versus Lifeboat as Ethical Approaches to Overpopulation." The following is a response to his comments, which have been published in the October 1974 issue of *BioScience* and, in a shorter version, in the September 1974 issue of *Psychology Today*.

There we sat, 1,600 biologists gathered for the annual convention of the National Association of Biology Teachers. The Imperial Room of the Americana Hotel, one of New York City's finest, glowed under a massive chandelier that gave no indication of an energy crisis. October 13th was a somber Sunday, and Garrett Hardin was describing his "lifeboat ethic."

This University of California biologist was telling us that the advanced nations of the world have brought disaster to the poorer nations, that charity, philanthropy, and foreign aid are destructive and stupid. He stressed a point: the more we interfere with the lifestyles of poorer peoples, less "progressed" peoples, the more disturbed become the basic laws of survival that have guided us for centuries.

I agreed with some of his premises, but I felt quite uncomfortable, sitting in such a luxurious ecosystem, at some \$40 a day, most of us stuffed to our ears with New York steaks and brew, insulated in layers and layers of silks, vests, \$20 shirts, and an abundance of adipose tissue. It was downright embarrassing to hear someone tell us that we should not share our goods with the poor of the world. "It is not a feasible policy to say it is our duty to share." Each nation is a lifeboat, he said, and each should seek its own survival at the expense of other lifeboats.

Hardin does have a point. The indiscriminate "aid" to foreign lands by 19th-century Europe and 20th-century America has contributed immensely to the world's population boomerang. We have induced an overproduction of babies and increased their lifespans, while doing little to increase the carrying capacity of the lands they inhabit. He said, "We say that there is a need for more food. We could just as well say that there is a need for fewer people."

If he is correct, one might ask how best to successfully meet the "need for fewer people": by allowing those who are alive to starve to death, or by strongly proposing family planning? It would be most inhuman and arrogant for us to turn our backs on the needy and the dying. We may think we live in an isolated lifeboat, but the oil crisis has shown us that we do not. Nations are not becoming isolated but increasingly interdependent. The lifeboat ethic is an armchair game whose rules are extinct.

We have destroyed the ecostability of many foreign lands, by trying to help them; that may be difficult to deny. But regardless of who is responsible for the world's population dilemma, we now have three choices: (i) let them drown (the lifeboat ethic); (ii) continue our present course of charity, philanthropy, and foreign aid; or (iii) do all we can to create a meaningful existence for every person alive, while initiating massive family-planning programs. I prefer the third, for the other two are (i) inhumane, or (ii) ineffectual.

We may not be able to feed the world, for our food supply is said to be depleting. But can we not stop blacktopping our farmland with interstate highways running parallel to each other, and stripping our forests to assure one-level abodes on two-acre lots for every citizen who manages to escape the metropolis? The citizen is selfish. Hardin calls this selfishness one of the prime reasons why we who are still alive are still alive. But surely our government could call a moratorium on "progress." We could begin to extend lifelines to the other lifeboats, instead of tossing food packages, most of which never reach the intended recipients... for our aim is quite poor. We could begin to build a world community, tying all the lifeboats to-

gether, instead of giving away what we consider to be excess baggage.

The "lifeline ethic" would lead to a more equitable world government; and until we have such an array of juxtaposed lifeboats, all floating together and providing far greater buoyancy, each lifeboat will exploit every other lifeboat. In the face of increasingly depleted resources, any species of higher animal begins to war. It will become crucial for all lifeboats to merge before the threshold for aggression is surpassed. We must construct international inhibitions to warring, as we have constructed social inhibitions to overt aggression. Otherwise no lifeboat will remain afloat. It is foolish to think otherwise.

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DUBIOUS METHODOLOGICAL VALIDITY

Once before I wrote to indicate my concern about the publication in *ABT* of research studies that have dubious methodological validity. The September issue in another case in point with the article by L. A. Seymour et al. on "A Successful Inquiry Methodology" (*ABT* 36[6]:349). The small differences between IRA and non-IRA students could easily be accounted for by the fact that the two samples were not random samples. There is a good probability that the teachers who were selected or volunteered to use IRA materials were either better teachers or were in more favorable school settings. This kind of potential systematic bias completely vitiates the conclusions drawn in the study.

My concern is to increase the number of educational decisions we make on the basis of valid research results. If we continue to publish in *ABT* studies that are of dubious validity, we discourage the use of such studies as a basis for decision making in the long pull. Increasingly, teachers learn that from decade to decade there are new fads, all backed by some kind of "research" findings, and they begin to lose faith in this approach to decision making. Granted that good research studies are very hard to find (I found only about 20 in some 600 I reviewed for the ERIC summary of research published recently), but we must keep on trying.

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L. A. Seymour comments:

The "small differences between IRA and non-IRA students" were actually quite large in the case of cognitive inquiry and associated attitudes. The IRA students exceeded the non-IRA students by wide margins, despite the fact that non-IRA students had superior abilities as measured by the Differential Aptitude Test. Covariance was not used and thus the differences in favor of the IRA students were, in fact, larger.

The teachers designated IRA and non-IRA were in the same high schools. They were recommended by their supervisors as having similar abilities and experience. Because funds were limited, however, extensive data were not collected on the teachers to determine which group may have been "better." Also, funds were inadequate to randomly assign a large number of teachers in a national sample. This procedure would obviously be preferred.

Let me remind you of the four questions raised and answered in the article: (i) Can students develop inquiry skills? (The answer was definitely yes.) (ii) How does development in the inquiry-oriented class compare with development in other biology classes? (See the preceding discussion.) (iii) Do students prefer classroom settings in which inquiry is emphasized and developed. (The answer was definitely yes.) (iv) Can teachers learn and execute the new methodology adequately to attain the intended outcomes? (Again, the answer was definitely yes.) You comment directly on only one of these four questions. I would welcome your comments on all four.

"FROG CONSERVATION"

The Committee on Social Responsibility of the Society for Developmental Biology conducted a workshop last summer to discuss the decrease in supply of living leopard frogs (*Rana pipiens*) and the poor general vigor of animals which are captured in the wild. Biologists and commercial suppliers have offered many suggestions about probable causes of this "frog problem." It seems likely that decreased habitat (especially drainage of breeding ponds), increased pollution by agricultural runoff, recent unusual spring weather in some production areas, as well as various undetermined factors, have lowered the frogs' resistance to common bacterial and viral pathogens. Not only has the adult population been affected; there are reports of unusually high incidences of developmental arrests in egg masses in the field.

Normally, heavy harvesting does not seem to affect frog population sizes significantly, but the present situation may be a special one. The very frogs which could be the hardy core of a regenerating population seem to be the ones most easily harvested now because they are able to carry on normal activities in traditional collecting areas. With this in mind, we appeal to biologists to consider reducing their current use of living frogs.

Although the large populations that have supported heavy harvesting have been badly depleted, no expert we consulted believes that *Rana pipiens* is in immediate danger of extinction. In addition, it is highly unlikely that conservation by biologists will be a major factor in bringing about a quick return to former population levels. Nevertheless, responsible biologists should contribute to efforts to conserve this organism, which has served so many of us so well in teaching and in research. Because there are an estimated five frogs used in teaching for every one used in research, a heavier responsibility falls on those of us who use *Rana pipiens* in teaching laboratories.