

# Ecology in the classroom: uniting the specialists

**Growing student and community concern  
over the environment crisis is prompting colleges  
to begin a multidisciplinary approach to ecology**

by John Potter

The departmental framework, setting discrete studies apart from one another, is a matter of tradition and administrative efficiency in most universities. It has many defenses, but it is creating a barrier to interdisciplinary study at a time when intrinsically complex ecological systems are demanding vastly coordinated efforts to understand them.

A paramount academic controversy today, with implications for many fields of study, centers on how best to handle ecology as a scientific discipline. It has pitted the advocates of interdisciplinary education against those who insist that a scientist's education must be predicated on thorough grounding in a single discipline. It is a controversy between specialists and generalists.

**There appears** to be a growing trend in higher education to adopt the generalist point of view: Over 100 colleges and universities recently polled by the House Subcommittee on Science and Research were found to be undertaking separate programs in the interdisciplinary study of the environment.

Although the House study indicated a range from campus to campus, and considerable restriction of environmental emphasis to the framework of the existing course structure, the major response to the environmental challenge appears to have been consolidated study centers growing out of schools of medicine, the life and physical sciences and engineering. Almost every institution of higher education appears to be making some response to the environmental challenge, with greater or lesser wrenching of the traditional course structure.

Pioneering centers at Washington University at St. Louis and the Universities of Michigan, California and Wisconsin figured largely in the poll. But there appears to be an emphatic shift as well on the part of smaller schools.

"To our surprise," says one participant in the House study, "we found substantial activity in the undergraduate-oriented colleges, technical schools, teacher-training institutions and the small colleges responding to community initiative in addressing local environmental problems."

**Although the** general approach to environmental studies is now being framed, in the major universities through study centers and the small college in finding a public service role to play, the impetus of the movement in both instances can be found in the students and young faculty. And it may be doing for science education in the 1970's what nuclear physics did in the 1950's and Sputnik did in the 1960's (SN: 12/20, p. 575).

"The concern of students and young faculty is not an evolutionary outgrowth of traditional curricula. It is external," contends Dr. Barry Commoner, director of the Washington University center, "and it is the only thing bringing students back to science."

Universities responding to the pressure to study the environment are finding the study of ecology to be a meeting ground for all the disciplines ranging from biomedicine to the study of law.

To Dr. John F. Reed, chief of the National Science Foundation's section on Ecology and Systematic Biology, ecology is a contemporary struggle of the scientific conscience. He finds it relating disparate disciplines to a unifying sense of social responsibility.

Although the National Science Foundation is augmenting funds to support some interdisciplinary study, the agency currently reflects the prevailing Federal grant policy. This has in the past involved some institutional and department support programs. But in recent years it has acted to lock university research into single-depart-

ment programs, emphasizing short-range research geared to practical applications in terms of the mission of the funding agency. This leaves little room for innovation; ecologically oriented Federal agencies are just the ones that lack a tradition of university support.

The University of Oklahoma, already putting together a faculty pool for broad environmental studies, was turned down this year in its request for a Science Foundation grant. So far it has found no alternative source of funds.

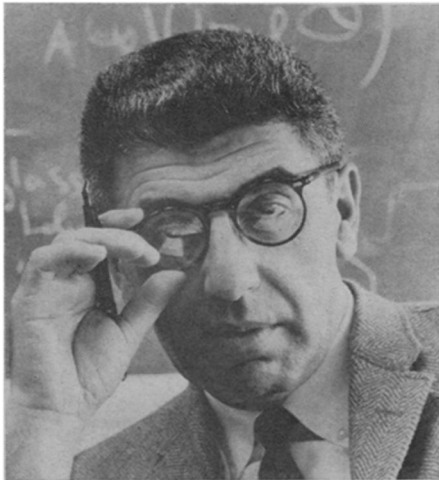
The effect is to perpetuate fragmentation in the face of growing demand for unification. Too much information having immediate application to public problems, argues Dr. Commoner, is locked within separate disciplines and must be brought to light. "I think the challenge of environmental studies can have a healthy effect on how we approach all disciplines," he says.

While Dr. Commoner finds value in shaping undergraduate and graduate school perspectives on the study of whole organisms and global ecosystems, Boston University's Dr. Arthur Johanningsmeier argues that a distinction between the hard-core traditional specialist and the vaguer new emphasis should be retained.

**"Ecology is** a hybrid science, and problems in ecology require the team effort of specialists deeply learned in particular fields," he says. His reasoning is part of the bulwark behind which can be found partisans of a more formal departmental structure.

Dr. J. G. Tanner at the University of Tennessee, for instance, agrees with Dr. Johanningsmeier in describing ecology as essentially a biological science, and says that it must be approached along the established lines of the separate disciplines.

Undergraduate ecology is taught at Tennessee as an elective by coop-



Washington University

*Commoner: An ecological challenge.*

erating professors from the departments of microbiology, biochemistry, botany and zoology. Dr. Tanner also views whole-environment study as an administrative problem of coordinating the efforts of professors in separate departments. "This involves a lot of red tape," he says.

"There would be much internal bickering to set up such departments," says Dr. Charles Cooper, chief of the National Science Foundation's section of ecosystem analysis.

Observing the axiom that the study of science eventually yields to the trends of the time, Boston University's Dr. George P. Fulton sees a growing emphasis on the environment in traditional study areas. Although Boston University does not plan a formal ecological undergraduate program for the near future, Dr. Fulton says the sense of environmental urgency has already pervaded the formal curricula of the life sciences, prompting the university to initiate a series of environment-related noncredit seminars open to all.

**But the sense** of crisis has reached more deeply into other institutions, which are beginning to shape whole administrative units devoted to the unified treatment of the environment.

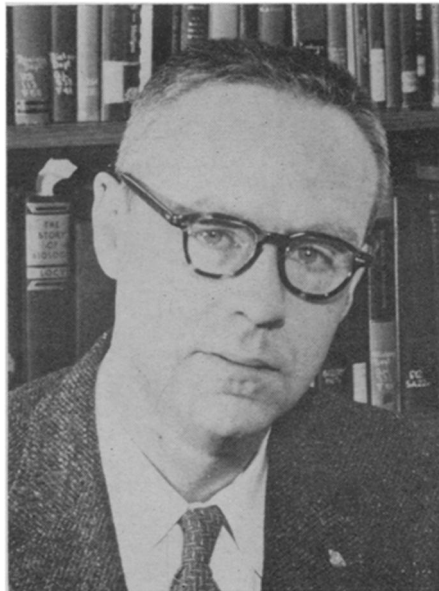
Alfred University at Alfred, N.Y., with a small enrollment, has established an environmental studies program with extensive cooperative arrangements with other eastern regional schools. Alfred is improving its curriculum in the sciences and social sciences in a program viewed as a joint effort at investigating what it sees as the critical problems of the human community.

Boston College at Chestnut Hills, Mass., facing intensive competition with the great New England concentration of major institutions, has already established a center for environmental research involving undergraduate honor students, graduate researchers and faculty. The college



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Boston University

*Fulton: Sense of ecological urgency.*

describes its program as a "multidisciplinary study of the gross biotic environment."

Another center, at Bowling Green State University in Ohio, is focusing on the rational planning of natural resources utilization.

And, working with the International Biological Program at Eagle Lake Field Station, California's Chico State College has developed an environmental studies center combining biology, engineering, anthropology and history.

Still another example of the new trend in ecological studies will soon be visible on the coast of Maine near Bar Harbor, with the establishment of the College of the Atlantic. Now in its planning stage, the ambitiously named local college is already shaping an en-



College of the Atlantic

*Seldon Bernstein: Bridging the gap.*

tire curriculum related to an emphasis on human ecology.

"It is our hope that the College of the Atlantic will bridge the gap between the conventional departmental structure and the immediacy of public problems," says Seldon Bernstein, a member of its board of directors and of the curriculum-planning staff.

**Scheduled** for opening in late 1971, the college has already attracted 50 staff applicants, many with distinguished backgrounds. "Every applicant expressed the hope of working in a small college context with committed young," Bernstein says. "The younger generation is looking hard for relevancy in college studies. Ecology is real to them. This college will try to keep it that way." □