

## Environmental Pollution: Scientists Go to Court

With the old rule of equity—"No wrong is without a remedy"—emblazoned on their banner, a few scientists and an aggressive young Long Island lawyer are trying to use the courts to attack problems of environmental disturbance and contamination. Their organization, the newly formed Environmental Defense Fund, Inc. (EDF), began attracting national attention this fall through its suits to prohibit the Michigan and federal departments of agriculture from using dieldrin, a persistent chlorinated hydrocarbon pesticide, on a Lake Michigan watershed.

Neither the Michigan suit nor an earlier court action on Long Island by EDF's prime movers has yet resulted in the legal precedents desired, however, and the efficacy of the EDF legal strategy and philosophy is still to be demonstrated. But already the EDF experience suggests that scientists and lawyers have opportunities, largely neglected in the past, to collaborate in promoting the cause of conservation.

The goal EDF has set itself is nothing less than that of persuading the courts to recognize that, as a matter of equity and constitutional privilege, the citizenry has a right to the cleanest possible environment consistent with

the general welfare. The constitutional argument is vague, but, briefly, it is that, while such a right is nowhere specifically mentioned in the Constitution, it can be inferred.

The emerging EDF doctrine holds that those who pollute and disturb the environment in the name of progress and economic necessity should be required to show that their actions are, in fact, in the public interest. For example, a state agriculture department should be made to justify its use of dieldrin or DDT over chemical compounds which break down rapidly and pose no major threat to wildlife. To prove to a "reasonable degree of scientific certainty" that use of dieldrin and DDT is not justified, EDF has been putting qualified scientists on the witness stand.

Other conservation groups and conservation-law foundations sometimes resort to court action. EDF, however, appears to be the only group primarily dedicated to a pioneering courtroom effort to establish important precedents in conservation law.

The idea of creating EDF grew out of a suit filed 25 April 1966 against the Suffolk County Mosquito Control Commission, by Victor J. Yannacone, Jr., a 31-year-old lawyer, on behalf of his wife, Carol, and all other people of Suffolk County, Long Island. A report that the dumping of DDT by commission employees was suspected to be the cause of a fish kill in a lake near her childhood home was one of a number of things that aroused Mrs. Yannacone's indignation. She asked the Suffolk County Supreme Court to forbid the commission from spraying local marshes with DDT.

The suit quite clearly was encouraged by her lawyer husband, an exuberant practitioner and something of a maverick at the trial bar. The Yannacone strategy was not to complain, in the manner of the usual suit, of personal damages. Instead, the suit, brought as a "class action," asserted that all citizens of the county suffer from an environment impaired by the use of persistent pesticides.

News of the suit inspired Charles F. Wurster, an assistant professor of biological sciences at the State University of New York, Stony Brook, to write a letter to the *Long Island Press* deploring the use of DDT for mosquito control. Yannacone later met with Wurster and several other members of the Brookhaven Town Natural Resources Committee.

These included George M. Woodwell, chief ecologist at the Brookhaven National Laboratory and Dennis Puleston, Brookhaven's chief of information and a part-time ornithologist who has studied the relationship between pesticides and the sharp decline in Long Island's osprey population. Wurster, Woodwell, and Puleston were to make up the nucleus of Yannacone's coterie of expert witnesses and, later, were to be among EDF's ten founding trustees.

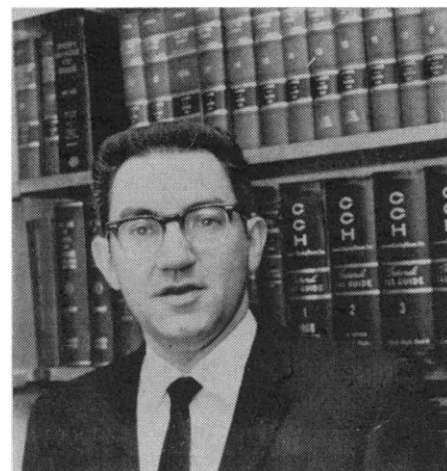
The Suffolk County court, acting partly on the basis of affidavits submitted by the scientists, issued a temporary order on 15 August 1966 forbidding the Mosquito Control Commission to use DDT. The 6-day trial, held in November 1966, was taken up largely with the testimony of scientists and other expert witnesses presented by Yannacone and by counsel for the commission.

Although Yannacone had had no formal training in ecology, his scientist friends say that, in working with them to prepare for the trial, he grasped the fundamental scientific issues quickly. "His performance [in court] was little short of brilliant," says Woodwell. For his part, Yannacone is enthusiastic about the testimony given by the scientists. "Those guys are virgin witnesses," he says.

Woodwell, Wurster, and several



George M. Woodwell, head of EDF's scientific advisory committee.



Victor J. Yannacone, Jr., EDF's legal counsel and prime mover.

other scientists testified that any further use of DDT would lead to increased losses of Suffolk County's wildlife. In some instances, counsel for the Mosquito Control Commission unwittingly led them into testimony damaging to the commission's cause. Take, for example, the following series of questions by the commission counsel and answers by Wurster.

Q. Now, isn't it a fact that everybody in this room has got DDT in them, isn't that right?

A. That's right.

Q. And most of the birds you find flying around, they will have DDT in them, isn't that right?

A. That's right.

Q. And as a matter of fact if you were to make a study and use some birds as a control, you would find that a lot of them had more DDT in them than those that you found dead and analyzed in your laboratory, isn't that correct?

A. No, that's absolutely wrong.

Whereupon Wurster gave a detailed account of an experiment in which DDT was used for control of Dutch elm disease in New Hanover, New Hampshire, but not in Norwich, just across the river from New Hanover. In New Hanover 70 percent or more of the robins died, whereas in Norwich the population of robins actually increased, Wurster said.

Through questioning the superintendent of the Mosquito Control Commission and other witnesses presented by the defense, Yannacone sought to discredit defense arguments. For instance, there was the following exchange between Yannacone and Christian T. Williamson, the commission superintendent, who had testified that when DDT is properly applied no harmful buildup of DDT residues in the food chain of fish and wildlife results.

Q. [Yannacone]. I would like to find out where [you] got this opinion.

A. Well, it is my personal opinion and logic.

Q. You don't base it on any technical literature?

A. I cannot pinpoint or report on technical literature that a statement of that kind may have been in, so I can't say.

Q. You formulated this opinion. Do you consider yourself an expert?

A. On what?

Q. On this particular subject.

A. No.

Q. Oh, then those weren't expert opinions?

A. You are talking about the build up in the food chain, and I am not an expert on the food chain. . . .

Q. Did you form [your opinion] from personal observation in 35 years of field

## NEWS IN BRIEF

● **RACE REPORTS:** The Council of Graduate Schools has urged the U.S. Office of Education to eliminate the reports that colleges and universities must furnish showing the racial composition of their enrollments (*Science*, 15 Sept., p. 1293). A resolution, passed by the Council during its annual meeting, noted that while the reports were intended to bring about an end to racial discrimination, they actually represent "a form of discrimination in reverse" because they "require the categorizing of students into racial groupings such as 'white,' 'Negro,' and 'other.'" The resolution said, "the acquisition of such data in effect requires the institution to record inexact observations of racial characteristics or engage in the offensive practice of direct questioning of students regarding racial origin."

● **SOCIOLOGISTS' VIEWS: WAR:** Thirteen hundred fellows and active members of the American Sociological Association have signed an open letter to President Johnson protesting "the continued bombing of North Vietnam and the killing of innocent civilians." The letter urged "an immediate and unconditional cessation of the bombing of North Vietnam; an immediate, vigorous and genuine attempt to seek negotiations for peace and representation of all parties concerned; orderly, phased withdrawal of American forces from Vietnam."

● **WHALE RESEARCH:** The U.S. Bureau of Commercial Fisheries has announced it will collect as many as 100 gray whales (*Eschrichtius gibbosus*) between 17 January and 12 February 1968 for research use. The whales will be landed at Richmond, Calif., where investigators will be allowed to obtain data and material. Additional information may be obtained from the Marine Mammal Biological Laboratory, Sand Point Naval Air Station, Seattle, Wash. 98115.

● **HISTORY OF GENETICS:** Manuscripts and printed materials on the history of genetics are being solicited by the Library of the American Philosophical Society of Philadelphia. The correspondence, journals, notes, and other papers of Albert F. Blakeslee, Charles B. Davenport, Milislav Demerec, Herbert S. Jennings, and George

H. Shull are now in the library as well as smaller groups of William E. Castle's and Thomas Hunt Morgan's papers. The materials are available for research, subject to conditions imposed by the donors.

● **ENGINEERING ART:** Experiments in Art and Technology, Inc. has announced a competition for the best contribution by an engineer to a work of art produced in collaboration with an artist. A first place award of \$3000 and two second place awards of \$1000 each will be made to engineers for their technical contribution to the collaboration. Selected works from the competition will be displayed at the Museum of Modern Art, New York City, during the fall of 1968. Entries should be submitted by 1 June 1968. More information is available from Experiments in Art and Technology, Inc., 9 East 16 St., New York 10003.

● **OBERLIN DRUG CODE:** The General Faculty of Oberlin College has adopted a policy statement on student drug use in which marijuana is separated from a general definition of "drugs." Under the code, "Drugs are defined as including barbiturates, amphetamines, prescription tranquilizers, LSD compounds, mescaline, psilocybin, DMT, narcotics, and opiates." The code states that possession or consumption of drugs "may be subject to severe penalties up to and including expulsion" while the "penalties invoked for possession, consumption or sharing of marijuana, or misconduct resulting therefrom, will generally be less severe, but may include the entire range of penalties up to and including suspension."

● **NEW PUBLICATIONS:** A special issue devoted to chemical and biological warfare has been published by *Scientist and Citizen*. Copies may be obtained for \$1 each from the Committee for Environmental Information, 5144 Delmar Blvd., St. Louis, Mo. 63108. The National Science Foundation recently released another in a series of statistical studies on industrial research and development. Titled *Basic Research, Applied Research, and Development in Industry, 1965*, copies may be obtained for 65 cents each from the Government Printing Office, Washington, D.C.

## Scientists and Engineers for McCarthy

A group of Massachusetts academicians and industrialists last week expressed opposition to the renomination of President Johnson by announcing the formation of Scientists and Engineers for McCarthy.

The group, which will work in behalf of Senator Eugene McCarthy, the Minnesota Democrat who is a very long-shot contender for the Democratic presidential nomination, includes many members of the 1964 Scientists and Engineers for Johnson-Humphrey movement. Spokesmen for the new group said they are abandoning the President this time around because of his Vietnam policies and what they consider his neglect of urgent domestic problems. In 1964, explained Nobel laureate Edward M. Purcell, "we had an incumbent who wanted peace. Now we have an incumbent who wants war."

About 65 scientists and engineers had joined the movement as of last week, including five Nobel laureates and 16 members of the National Academy of Sciences. The Nobelists, in addition to Purcell, are Konrad Bloch, Albert Szent-Györgyi, George Wald, and James D. Watson.

Significantly, the group includes two men who have served on the President's Science Advisory Committee (PSAC) under President Johnson (though both were appointed under earlier presidents). They are Jerrold R. Zacharias, who served from 1952 to 1958 and from 1961 to 1964, and who is still chairman of PSAC's Panel on Educational Innovation, and Purcell, who served from 1957 to 1960 and from 1962 to 1965, and who is still a panel consultant.

There was no indication last week whether such key members of the 1964 Johnson-Humphrey support group as Jerome B. Weisner and George B. Kistiakowsky, both former presidential science advisers, will join the McCarthy group.

Scientists and Engineers for McCarthy seems to have been slapped together in somewhat disorganized fashion after a lunch staged by McCarthy's Bay State supporters for some 50 academics at the Harvard Club of Boston. The scientists announced the formation of their new group last week in a quarter-page ad in the Boston *Globe* and at a press conference. Purcell told reporters no real effort had been made to recruit members. Most of the original 65 come from M.I.T. and Harvard, with a scattering from other academic institutions, research facilities, and industries throughout the state.

The name—Scientists and Engineers for McCarthy—was deliberately chosen to evoke memories and suggest how much the situation has changed since the 1964 Scientists and Engineers for Johnson-Humphrey campaign. Purcell said he would like to give the President the following message: "We were all for you then. We're not now. It isn't we that have changed."

Salvador Luria, M.I.T. biologist, said on behalf of the group: "The insistence on military victory in Vietnam, and the low priority given to the fight against poverty and urban decay at home, have produced a deep frustration and a sense of loss of national purpose. A new leadership is needed."

The organization's newspaper ad urged "a redirection of our national efforts: *away* from the inexorable pursuit of military victory in Vietnam; *towards* a more constructive role in world affairs; *towards* the mobilization of resources for the solution of pressing national problems."

Ascher H. Shapiro, head of the department of mechanical engineering at M.I.T. and a principal organizer of the group, predicted that a national Scientists and Engineers for McCarthy organization would be established in the near future. Luria said he has already received calls from interested people in Wisconsin and California, two states in which Senator McCarthy plans to oppose the President in next spring's primaries.—P.M.B.

experience or did you form it from reading technical literature?

A. I read it. I formed it from reading literature . . .

Q All right. Now, what technical literature did you base it on?

A. I couldn't give it to you. I don't know.

The trial ended shortly after the defense agreed to stipulate to the court that DDT is harmful to fish and wildlife. Judge Jack Stanislaw, who had received the great mass of technical testimony with forbearance, took the case under advisement. He did not rule until a few weeks ago, when he lifted the ban on using DDT for mosquito control. The ban was reinstated shortly thereafter when Yannacone petitioned for further hearings in the case.

Early this fall, while a decision in the Suffolk County case was still pending, Yannacone and his scientist friends set up EDF and filed more court suits. Speaking in October before the National Audubon Society convention, Yannacone proposed the establishment of a legal action group dedicated to defense of the environment. "Conservationists should look to the 50-year history of the human rights struggle in the American courts," he said. "Somebody had to sue somebody before the legislature acted." The Audubon convention adopted a motion approving the EDF concept and referred it to the society's board of directors.

However, Yannacone and his friends proceeded on their own, moving immediately to have EDF incorporated as a nonprofit, tax-exempt membership group established for scientific and educational purposes. In addition to the Yannacones and the three Long Island scientists mentioned above, there were five other founding trustees, among them Robert E. Smolker, an embryologist at Stony Brook; Anthony S. Taormina, a wildlife biologist and Long Island regional supervisor for the New York department of conservation; and H. Lewis Batts, Jr., a biologist at Kalamazoo College, who was the first to propose to the Audubon convention that an environmental defense fund be created. The Audubon Society has since contributed about \$7600 to EDF to cover the cost of reproducing the trial record in the Suffolk County case.

In November, EDF brought its first court action in its own name. It sought to prevent the use of dieldrin in a cooperative Japanese-beetle-control proj-

ect in Berrien County, Michigan, by the Michigan and U.S. departments of agriculture. The dieldrin was to be sprayed by airplane over a 2800-acre forested Lake Michigan watershed, where beetles had appeared and were believed to threaten nearby fruit orchards.

The EDF suit, naming the Michigan department of agriculture as defendant, was initiated at the urging of Batts and a number of other Michigan conservationists. Ralph MacMullan, a Ph.D. in zoology and head of Michigan's department of conservation, was willing to testify and present affidavits. Largely from his own resources, Batts had raised \$10,000 to cover EDF's trial expenses, including a minimum fee for Yannacone.

Yannacone got a temporary order, from the state court of appeals at Grand Rapids, to stop the dieldrin spraying, but this injunction was dissolved after a 6-hour trial. Testifying for EDF were MacMullan and, among others, Woodwell, Wurster, and John F. Cantlon, professor of botany and plant pathology at Michigan State University and president-elect of the Ecological Society of America. Several conservation department affidavits, including one holding that the spraying would threaten Lake Michigan's new coho salmon fishery, were disallowed on a technicality when the state attorney general's office refused to let the department officially enter the case—a circumstance cited by EDF people as evidence of the political influence of the agricultural and other interests which benefit from the use or sale of pesticides.

In lifting the temporary injunction, the Michigan court said the agriculture department had not abused its discretionary authority, a judgment which the state Supreme Court subsequently refused to review. Though the ruling was unfavorable, EDF had generated a lot of publicity for its cause, and had delayed, at least, the state's use of dieldrin. State agriculture officials say that next year, after the spring thaw, the dieldrin will be used as planned, but EDF hopes that public sentiment aroused by the trial will lead them to abandon the project. An EDF suit now pending in the U.S. District Court at Grand Rapids to keep Michigan cities from using DDT for Dutch elm disease control has helped inspire Michigan State University entomologists and state agriculture officials

## A POINT OF VIEW

*J. William Fulbright, chairman of the Senate Committee on Foreign Relations and former president of the University of Arkansas, in a speech to the Senate, 13 December.*

More and more our economy, our government and our universities are adapting themselves to the requirements of continuing war. . . . I do not think the military-industrial complex is the conspiratorial invention of a band of "merchants of death." . . . It is rather the inevitable result of the creation of a huge, permanent military establishment. . . .

The universities might have formed an effective counterweight to the military-industrial complex by strengthening their emphasis on the traditional values of our democracy, but many of our leading institutions have instead joined the monolith, adding greatly to its power and influence. Disappointing though it is, the adherence of the professors is not greatly surprising. No less than businessmen, workers and politicians, professors like money and influence. Having traditionally been deprived of both, they have welcomed the contracts and consultantships offered by the military establishment. The great majority of American professors are still teaching students and engaging in scholarly research, but some of the most famous of our academicians have set such activities aside in order to serve their government, especially those parts of the government which are primarily concerned with war.

The bonds between the government and the universities are no more the result of a conspiracy than those between government and business. They are an arrangement of convenience, providing the government with politically usable knowledge and the universities with badly needed funds . . . a contribution, however, which is purchased at a high price. That price is the surrender of independence, the neglect of teaching, and the distortion of scholarship. A university which has become accustomed to the inflow of government contract funds is likely to emphasize activities which will attract those funds. These, unfortunately, do not include teaching undergraduates and the kind of scholarship which, though it may contribute to the sum of human knowledge and to man's understanding of himself, is not salable to the Defense Department or the CIA. . . .

Among the baneful effects of the government-university contract system the most damaging and corrupting are the neglect of the university's most important purpose, which is the education of its students, and the taking into the government camp of scholars, especially those in the social sciences, who ought to be acting as responsible and independent critics of their government's policies. The corrupting process is a subtle one: no one needs to censor, threaten or give orders to contract scholars; without a word of warning or advice being uttered, it is simply understood that lucrative contracts are awarded not to those who question their government's policies but to those who provide the government with the tools and techniques it desires. The effect, in the words of [a special] report to the Advisory Commission on International Education, is "to suggest the possibility . . . that academic honesty is no less marketable than a box of detergent on the grocery shelf." . . .

When the university turns away from its central purpose and makes itself an appendage to the government, concerning itself with techniques rather than purposes, with expedients rather than ideals, dispensing conventional orthodoxy rather than new ideas, it is not only failing to meet its responsibilities to its students; it is betraying a public trust. . . .

It seems . . . likely that the basic cause of the great troubles in our universities is the student's discovery of corruption in the one place, besides perhaps the churches, which might have been supposed to be immune. . . .

to encourage the use of methoxychlor, a less persistent pesticide.

The fact remains, however, that the refusal of the Michigan state courts to grant an injunction against the use of dieldrin was a defeat for EDF. To this setback was added another when Judge Stanislaw finally ruled in the Long Island case on 30 November. He held that, while DDT was admittedly harmful to wildlife, use of this pesticide did not appear "wholly unjustifiable or so manifestly and broadly injurious as to compel [its] cessation." Essentially, his position was that banning DDT is a matter for the legislature to consider, though Yannacone contends that legislative and administrative bodies have largely ignored warnings about the effects of such "hard" pesticides. Stanislaw still has under consideration the request for a reopening of the trial.

It is in the federal courts that Yannacone hopes to strike a decisive blow against governmental use of dieldrin and DDT. In a suit filed 1 December in the U.S. District Court in Brooklyn, New York, EDF seeks to stop the U.S. Department of Agriculture from taking part in the dieldrin-spraying project in Michigan and from continuing to recommend DDT for control of Dutch elm disease.

If and when this case is heard, Yannacone's argument will be based in part on the Ninth Amendment, a seldom-cited constitutional provision which simply says, "The enumeration in the Constitution of certain rights, shall not be construed to deny or disparage others [such as the right to an uncontaminated environment, EDF says] retained by the people." Also, his case will rest on the constitutional guarantees that all citizens shall enjoy equal protection of the laws and that none shall be deprived of life, liberty, or property without due process of law. Thus, he will argue that the courts must hear the scientific evidence about the ecological damage done by the application of dieldrin by governmental agencies—which, in the Berrien County case, happen to be acting largely for the economic benefit of fruit growers.

Yannacone's theories are unorthodox, and it is by no means unlikely that the courts will reject them. Robert Jasper, general counsel of the Conservation Law Society in San Francisco, predicts precisely such an outcome. "You just can't stretch the Constitution that far," he remarked to *Science*. Jasper

believes, however, that through conventional damage suits, such as those brought against upstream polluters, what amounts to a citizen's right to an uncontaminated environment may be established.

The Environmental Defense Fund is as yet little known by most conservation groups, and the EDF concept and legal approach have not received their considered appraisal. But it is clear that not all of them will embrace EDF as quickly as the Audubon Society has done. David Brower, director of the Sierra Club, which is by far the most militant of these groups, suspects that EDF has not prepared adequately for its undertakings.

"I think there needs to be more consultation with some people who are older and stuffer," he says. Such consultation, one might add, should extend to leaders of organizations such as the American Civil Liberties Union and the National Association for the Advancement of Colored People's Legal Defense Fund, groups Yannacone regards as akin to EDF. Organizations of this kind have done much to lead the courts to broaden their definition of constitutionally protected rights.

Even though EDF has yet to win a court suit, Yannacone and Puleston (EDF's board chairman) have drawn up a proposal for a \$350,000 foundation grant, which would be used over a 6-month period to develop a program of legal action and education. To some, this may seem a plea for too much, too soon. A case surely can be made, however, for giving EDF the support necessary to test its potential.

Even if EDF's search for major new legal precedents is unsuccessful, the group's usefulness will not necessarily be at an end. For EDF could then consider devoting itself to court and administrative proceedings in which existing laws and accepted legal principles could be invoked. For example, EDF might keep enforcement of the new air- and water-pollution laws under review.

In fact, it should be able to bring substantial expertise to bear on a variety of environmental questions. A significant feature of EDF is its scientific advisory committee, made up of three EDF trustees plus an ecologist at Yale and one at the University of California's Irvine campus. This group, chaired by Woodwell, plans to establish a number of *ad hoc* committees which will

pool the talents of scientists and social scientists in various disciplines.

The scope of EDF's interests ultimately may extend beyond environmental contamination to other problems, such as the generation of excessive noise, the dredging and filling of estuaries, and the needless destruction of other valuable natural areas. Indeed, the growing number and complexity of environmental problems itself suggests the timeliness of the EDF concept of lawyers and scientists going to court in the interest of achieving an ecologically sound habitat for man and beast.

—LUTHER J. CARTER

## APPOINTMENTS

**T. M. Barkley**, associate professor of botany and curator of the Herbarium at Kansas State has been named associate director of the division. . . .

**Louis A. Wienckowski**, deputy director, Division of Special Mental Health Programs and acting chief, Center for Studies of Narcotic and Drug Abuse, National Institute of Mental Health, to director of the Division of Extramural Research Programs, NIMH. . . . **W. L. Grant**, deputy director general and director of the Reactor Engineering Division, Atomic Energy Board, South Africa, to director general of the board. . . .

**Richard T. Smith**, chairman of the department of pediatrics, University of Florida, who has recently been on leave conducting studies at the Karolinska Institute, Sweden, to chairman of the department of pathology, University of Florida. He succeeds **Joshua Edwards** who has become chairman of the department of pathology, University of Indiana. . . . **Stan Ulam**, research adviser, Los Alamos Scientific Laboratory, to chairman of the department of mathematics, University of Colorado. . . .

**John S. Fabianek**, chief research chemist, Veterans Administration Center, Martinsburg, W.Va., to associate professor of chemistry and deputy chairman, department of life sciences, New York Institute of Technology.

*Erratum:* In the report "5-Hydroxytryptamine in the carotid body of the cat" by S. R. Chiochio *et al.* (10 Nov., p. 790), lines 21 and 22 of the third column should read "immersed in 0.1N hydrochloric acid, and assayed for 5-HT by the . . ."

*Erratum:* In the report "Enzyme concentrations in tissues" by P. A. Srere (17 Nov., p. 936), the first equation in the next to last paragraph of the first column on p. 937 should read:

$$\frac{U_c/kg_t}{U_o/g_o} = g_c/kg_g$$