Scientist and Citizen: St. Louis Group Broadens Educational Role

St. Louis. "By what means can scientists, who have no command over either the public news media or the machinery of government, overcome the governmental self-justification and journalistic inertia which so often impede public knowledge about complex, confused public affairs?" Barry Commoner asks in his recent book *Science and Survival.* Needless to say, Commoner, an articulate botanist who served as chairman of the AAAS Committee on Science in the Promotion of Human Welfare from 1959 to 1965, is not at a loss for an answer. He told *Science* in an interview that he had long been interested "in the concept of the scientist exercising responsibility as a public informer." For him, the St. Louis, Missouri, scientific information group, now called the Committee for Environmental Information (CEI), is "a test in life that this idea would work." For other scientists around the country who are interested in the scientific information movement, the fate of the St. Louis group is also a test of whether such an organization can continue to play a useful community role.

Founded in 1958 at a time of great concern over fallout from nuclear testing, the group (then called the Committee for Nuclear Information, CNI) has survived the decline in community interest which followed the 1963 test-ban treaty. Earlier this year, the group changed its name to the Committee for Environmental Information to reflect its broadened scientific interests. The CEI continues to fulfill all requests for speakers from many types of groups in the St. Louis area and actively promotes the fact that its scientists are willing to talk to community organizations. The CEI has more than 500 members, 200 of whom are in St. Louis; about a third of its members are scientists. The group operates on an annual budget of about $70,000, most of which comes from private gifts and foundation grants. Many scientists and lay members volunteer part of their time to CEI's activities. Members pay a $10 annual fee, for which they are entitled to attend the group's meetings and receive the committee's publication.

The main ornament and principal focus of CEI's activities is *Scientist and Citizen,* an attractive magazine which is published ten times a year. This publication has grown steadily more professional in appearance since its first mimeographed pages appeared in 1958; until 1964, the publication was entitled *Nuclear Information.* The magazine has a full-time staff and an energetic editor, Virginia Brodine. More than 6000 now subscribe. Some of its articles serve as the basis for news stories in the nation's newspapers. Most of its articles are written by CEI scientists; all are subjected to critical appraisal by the members of CEI's Scientific Advisory Board, most of whom are Washington University scientists.* Board members serve on committees representing the major areas of CEI's interest: air pollution, water pollution, pesticides, nuclear war and civil defense, reactors, and fallout. Each group is responsible for examining the literature in its area and for obtaining and examining articles.

Although the material in the magazine is subject to rigorous scientific scrutiny, it is written for the intelligent nonscientist subscriber. The publication often prints glossaries of technical terms which are used and relevant scientific or technical explanations, for example, a page on "How Reactors Work" accompanying an article on contamination from nuclear reactors. A Readers' Advisory Board composed of CEI members helps insure readability for the nonscientist. However, the somber, scientific quality of most articles is apparent. Readers' Advisory Board Chairman Mrs. Merrimon Cuninggim has written "Our publication can certainly not be classified as bedtime reading. . . . Its subject matter is usually sobering, to say the least, and the harassed businessman or housewife would hardly choose it as a pick-me-up to give the spirit a lift." Beginning with the January issue, *Scientist and Citizen* became an official publication of the Scientists' Institute for Public Information (SIPI), a national group based in New York. Edward L. Tatum, president of SIPI, recommended *Scientist and Citizen* as "a prime source of reliable information on questions of environmental conservation."

This step by SIPI makes CEI a central source for the scientific information movement in the country. Why did the movement bloom so much more profusely in St. Louis than in most other cities? An early explanation can be found in the fact that, in the late 1950's, the strontium-90 levels in St. Louis milk led all other cities then being studied by the Public Health Service. This well-publicized fact worried many St. Louis citizens. Some estimates indicate that milk sales may have fallen by as much as 20 percent in that period. The St. Louis Dairy Council requested help from the committee; a committee statement did much to relieve parental anxiety on the subject. In the same period, the committee began its "Baby-Tooth Survey" in which thousands of children's teeth have been collected to ascertain strontium-90 accumulation. This survey, which is still in progress, has done much to increase the community's awareness of the committee and, as one St. Louis newspaperman commented, "served as a natural public relations device." Pictures of gap-toothed children with the caption "I gave my tooth to science" used by the committee have obvious human interest appeal. The survey has attracted foundation and governmental grants which have helped keep CEI a going concern.

Some scientists at Washington University give partial credit for CEI's development to the atmosphere of intellectual freedom which exists at their university. "We don't have to take vows of political chastity here," one commented. Others say that St. Louis is basically such a conservative area that groups like CEI are especially attractive to the outnumbered liberals. According to the committee's members, CEI has received favorable coverage from the *Post-Dispatch,* St. Louis' lib-

* Although about 80 percent of the CEI scientists are at Washington University, the committee has no official connection with the university. The headquarters for the CEI and for *Scientist and Citizen* are located elsewhere in St. Louis at 5144 Delmar Boulevard. The committee charges an annual subscription rate of $5 for *Scientist and Citizen.* The committee has displayed its willingness to advise scientists in other cities who are interested in forming scientific information groups.

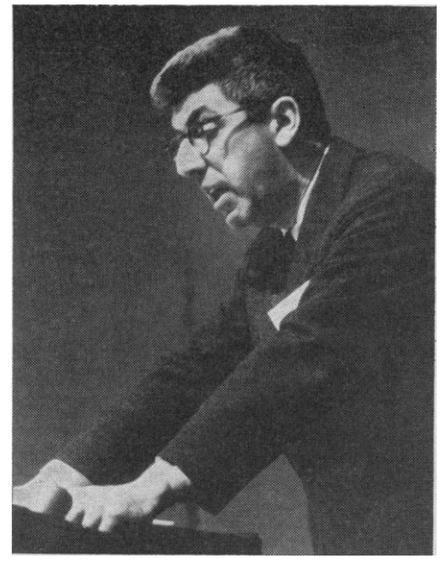
eral newspaper. Relations with the city's conservative newspaper, the *Globe-Democrat,* left much to be desired in the committee's early existence, but this situation has improved greatly in recent years, members say.

At the 1963 National Conference for Scientific Information, anthropologist Margaret Mead suggested that "St Louis is about the biggest community that could tackle this kind of community-based group." Dr. Mead suggested that a city like New York, Chicago, or Los Angeles, would be too large, and that in small communities there is no need for joint groups of scientists and citizens because the scientists are already involved in other community organizations.

Whatever particular advantages St. Louis may have for a scientific information organization, the essential element for any voluntary group's success is to find dedicated people. The CEI has been able to attract a number of scientists and laymen who are willing to devote a considerable portion of their time to the organization's activities. The man who is usually given credit for being the group's "spark plug" is the intense, bushy-haired Barry Commoner, a 50-year-old plant physiologist. Kurt Hohenemser, a professor of aerospace engineering who serves on the executive committee of CEI's scientific board, praises Commoner for having "a tremendous amount of energy" and calls him "the main driving spirit" of CEI. When interviewed, Commoner played down his current influence by saying that "for a number of years it was rumored that the only reason the committee existed was because of me. Maybe that was so, but it isn't any longer."

Commoner and other scientists helped found the committee in 1958. Commoner pointed out that two of the principal founders were active Quakers—Walter Bauer, a pathologist, and John Fowler, a physicist now at the University of Maryland. At another point in the interview, he noted that those active in CEI "have to be strongly motivated; many come in with a religious concern."

Some of those who founded CEI originally joined together to work for Adlai Stevenson in the 1956 Presidential campaign when Stevenson urged the suspension of nuclear testing. Before they organized their committee, some of the scientists were already fulfilling requests to speak to citizens' groups about fallout. From the beginning, both scientists and lay people



Barry Commoner, one of CEI's founders: "I guess I've always been a public speaker."

were united in the committee's work. The scientists in CEI are committed to having nonscientific colleagues. They feel that the nonscientists provide a healthy discipline for the scientists' writing and for their scope of activities. For instance, the lay members forced the scientists to concern themselves with civil defense during the period of the great public interest in this topic in the early 1960's. Lay people also prove helpful in giving and raising money, and, as John Fowler has commented, they have "been very useful in doing some of the tasks that the scientists don't do well at all: public relations, envelope stuffing, and so forth." Malcolm L. Peterson, who teaches at Washington University Medical School and who heads CEI's scientific division, states that "without the lay people, we wouldn't have been half so effective."

CEI's Composition

Biologists, physicists, and physicians are prevalent among the scientific contingent. Relatively few chemists and engineers are active in CEI. Among the physicians, internists and pediatricians predominate. At the time when mothers in St. Louis were worried about the effects of strontium-90 in their children's milk, it is estimated that a quarter of the pediatricians in St. Louis were members of the committee. "The doctors tend to be good speakers to community groups," Virginia Brodine comments.

Most of the scientists who become involved in CEI, Peterson notes, are in their 30's or 40's. The committee has not attracted many younger scientists (although some graduate students have been very active in CEI's work), nor do many scientists older than 50 join the group. "The commitment to CEI entails continued self-education, and many established scientists don't feel comfortable in this kind of commitment," Peterson said. Obviously, only certain kinds of people will seek out an unusual group like CEI. "They have to be crusading," Virginia Brodine said. "The career-oriented don't want to step on the toes of government or industry."

Benefits to Scientists

One apparent advantage which scientists feel that they gain from the collective CEI enterprise is an opportunity to deal more effectively with scientific questions of public policy than would be possible by their own individual effort. Another benefit many feel they receive is education in scientific areas other than their own speciality. "I'm not a radiation biologist by training," Commoner noted, "but I've had to master radiation biology. I had to become professionally competent in the field." Commoner also believes that CEI activity has "enhanced my concern for teaching" and has increased his sensitivity to student interest in the "humane consequences of biology." He has begun teaching an undergraduate course on "Biology and Modern Society" at Washington University, in which he uses a collection of issues of *Scientist and Citizen* as a textbook. Commoner thinks that many scientists tend to underestimate student and citizen interest in policy questions related to science. Malcolm Peterson said that his CEI participation has, to some extent, changed the way he speaks to medical students. He remarks, "I now talk to them about the health effects of air pollution and radiation."

The publication of *Scientist and Citizen* now assumes a more substantial portion of the activity of CEI scientists than it did in the early days of the organization. Peterson estimates that 90 percent of the time of the Scientific Advisory Board is spent on preparing material for the magazine. The most widely noticed issue was published in 1959; it was entitled "Nuclear War in St. Louis" and was a fictional account, based on congressional hearings, about what would happen in the city after a nuclear attack. The committee received 45,000 orders for copies; the article was reprinted in the *Saturday Review* and in several major newspapers.

Other issues of *Scientist and Citizen* which CEI members think had special influence include the 11-issue series on nuclear war and civil defense, those citing the dangers of iodine-131 in fallout from nuclear testing, those describing contamination from nuclear reactors, the issue describing a power company's plan to put a nuclear reactor near an earthquake fault on Bodega Head in northern California, and an issue with an evaluation of the Atomic Energy Commission's "Project Chariot" which would have involved nuclear explosions in northern Alaska. *Scientist and Citizen* joined with Alaska scientists in pointing out the danger of radiation from such explosions to Eskimo food sources; the project was later canceled. The information printed by the committee is reported to have circulated widely among the people in that area; one Alaska scientist, William O. Pruitt, Jr., said that he recalled "meeting an Eskimo driving a dog team on the trail one time, and, by golly, he had a copy of the CEI bulletin tucked inside his parka."

The principal message of the many issues of their magazine, as CEI itself once said, is that "extreme caution ought to be the rule in approving use of novel contaminants in the environment. . . . These principles of caution are illustrated by every issue of *Scientist and Citizen*."

One of the three announced purposes mentioned at the time of the committee's founding was the eventual expression of citizen opinion on policies relating to nuclear energy. However, after the first year of operations, the Board of Directors decided that the committee would never attain the kind of community support it needed as long as there was a possibility that it might become an organization for expressing opinions. Consequently, the Board adopted bylaws which denied the committee the possibility of ever taking a stand on issues. To this day, the CEI continues to assert that it takes no position on the problems it discusses. One of the CEI directors pointed out that this policy of refraining from advocacy has at least two benefits: first, it helps insure that contributions to the organization will be tax-deductible; second, it secures wider press publicity for CEI statements. In the committee, there is a widespread feeling that CEI would be less noticed if it allowed itself to be viewed as yet another "pressure group."

NEWS IN BRIEF

● **SOCIAL SCIENCE BILL**: A proposal that accounting be defined as a social science in S. 836, Senator Fred R. Harris's bill to establish a National Foundation for the Social Sciences, is under consideration by Harris's Subcommittee on Government Research. Lawrence L. Vance made the suggestion during hearings on the bill. He is president of the American Accounting Association and dean of the Graduate School of Business Administration at the University of California at Berkeley. Speaking as a private citizen, Vance told the subcommittee the definition would enable colleges and universities to apply for grants in accounting research under the proposed foundation.

● **WATER POLLUTION**: Representatives of the soap and detergent industry and the Department of the Interior have established a cooperative program to coordinate eutrophication research efforts. Eutrophication is the excessive fertilization of aquatic plants, primarily with phosphates and nitrates. The department has announced it also plans other joint eutrophication efforts with a number of industries, including fertilizer, chemical, and agricultural enterprises, that discharge phosphate and nitrate-containing wastes.

● **JUNIOR COLLEGE BOOM**: Enrollment in the nation's 837 junior colleges now accounts for more than 30 percent of the lower division undergraduate college enrollment, an NSF report notes. According to the study, 2-year colleges are being established in the United States at the rate of about one a week. In 1965, 50 junior colleges enrolled students for the first time. Last fall, 52 new junior colleges opened, and 54 new ones will open this fall. The report estimates that 100,000 additional teachers will be needed for junior colleges within the next 10 years. According to the report, "Given the indisputable fact of significantly larger junior college enrollments in the future, to say nothing of a greater number of junior colleges, the question of improving the quality (and the quantity) of science teachers to staff these colleges appears to be one of crucial importance." Junior colleges also share a problem with the 4-year institutions, that of "recruitment and retention of teachers." California has been the leading state in the establishment of junior colleges, followed by New York, Illinois, and Michigan. The report, *The Junior College and Education in the Sciences*, was prepared for the House Subcommittee on Science, Research and Development, and may be obtained without charge by writing the committee in Room 2321, Rayburn House Office Building, Washington, D.C.

● **SECRET RESEARCH ETHICS**: The council of the Federation of American Scientists has come out against classified military research on university campuses "except when a national emergency has been declared by the President of the United States, and then only in circumstances which require university participation." In a recently issued statement, the council of the 2200-member organization also recommended that the same concepts apply to university-owned laboratories, whether on or off campus. The statement declares, "Classified university research for government or industry compromises in a fundamental way freedom of discussion and criticism. To impose an official framework of secrecy on research in a university is antiethical to the spirit and requirements of scientific and scholarly study." It also asserts that when a university accepts classified research, "It submits to values and practices that threaten its basic functions of objective scholarly inquiry and teaching. Not only does it acquiesce in discrimination and give up open and independent inquiry, but its faculty loses the right to know what its own university is doing." The statement does not propose, however, to completely deny government and industry the use of university personnel for special classified work. Consulting and leave-of-absense arrangements were recommended for individual faculty members who wish to undertake classified research.

● **RESEARCH AWARD**: Recipients of the second annual Stouffer Prize are U. S. von Euler, a Swedish physiologist; Peter Holtz, a German pharmacologist; and J. W. Cornforth and George J. Popjak, British biochemists. They will share the $50,000 prize which is awarded by the Vernon Stouffer Foundation for outstanding research in hypertension and artherosclerosis.

However, it is clear that most people who examine problems in detail will develop their own opinions on desirable action. Needless to say, it is difficult for CEI members to keep their views hidden during their public activities. "In a way I may delude myself that I don't reveal my own bias when I speak to a group," Malcolm Peterson comments. "When I refuse to take a position, sometimes the audience gets madder than hell. They say, 'You scientists are all alike, you never take a stand on anything.' They leave disgruntled."

CEI's Objectivity

Although CEI may try hard to remain cool and objective, it usually discusses issues about which scientists find it difficult to be dispassionate. As Walter Bauer said, "Every problem we take up is controversial. There is no need for information on a noncontroversial problem." John Fowler has written about the beginning period of the committee: "The misleading press releases and Pollyanna view of fallout coming from the AEC needed our criticism." The committee has had a number of disagreements with the AEC and the Federal Radiation Council and no doubt will continue to criticize federal agencies when it believes that the government is distorting facts. Some CEI members talk of the national need for organized countervailing expertise to question government scientists. Peterson illustrates the spirit which characterizes CEI when he says, "The establishment often squelches debate." The CEI is committed to promoting debate.

Those who come into contact with the committee sometimes wonder just how free of value judgments CEI's statements are. At one point in an argument conducted in *Scientist and Citizen* over Project Harbor, a NAS–NRC report on civil defense, project director Eugene P. Wigner called upon the committee's Scientific Advisory Board to ". . . shed its nonpolitical pretense . . ."

Charles Copley, the St. Louis Air Pollution Control Commissioner, is one official who believes that CEI is, on the whole, of benefit to the city. But he also qualifies his praise: "They like to look on themselves as people who dispense scientific facts . . . but I'm not sure they really sustain the position that they just give the facts." Copley complimented CEI for engaging in "a lot of good research" but said that the committee likes to make "dire predictions" and puts "too much emphasis on what may happen." Copley said that there is some feeling in St. Louis that committee members let their political feelings interfere with their work in CEI.

In its early years, when CEI was challenging governmental information on fallout, there were those in St. Louis who regarded the committee as a left-wing organization. Now, there is not as much discussion of the committee's political composition. In an interview, Commoner said that many members would be "liberal Democrats" but that "some are Boy-Scout Republicans who are concerned with what's right; they are the kind governed by a strict morality." Commoner said that his group is not interested in influencing the legislative process but rather wishes to reach the public directly. "There is a big difference between us and the power-structure boys," Commoner said. In his opinion, "the Boston crowd" tends to ignore the public but in St. Louis, "we get into the PTA's, the Negro slums, the high schools; we get a feeling of how you can reach people on what concerns them."

During its almost 10 years of operation, the St. Louis scientific information group seems to have had some impact on the city, and, through *Scientist and Citizen*, on national discussion of various public issues. But, as the leaders of CEI would readily admit, no scientist should expect his educational work to perform overnight miracles in the citizenry.

At the 1963 National Conference for Scientific Information, Commoner talked about the condition of the scientist who takes his information role seriously: "After an evening discussing fallout or civil defense . . . with 50 or less members of the Young Couples' Club of the Baptist Church in Outer Suburbia, the scientist emerges into the night air, begins the long ride home, and thinks to himself—'At the rate of 50 per evening, how long will it take to educate the people of the United States?' The only honest answer to that question is, 'A long time.' "

—BRYCE NELSON

Radio Astronomy: Dicke Panel Reaches Its Conclusions

The National Science Foundation's high-level screening of radio astronomy proposals which would cost at least $130 million has turned out to be friendly but severe. On Monday 21 August, NSF announced that its specially convened radio astronomy panel of eight scientists under the chairmanship of Princeton University physicist Robert H. Dicke had advised NSF Director Leland J. Haworth to accept immediately only two proposals out of the six discussed before the panel in 4 days of hearings during the week of 24 July (*Science*, 18 August 1967).

The two projects recommended are probably the simplest and least expensive. Such a result would surprise nobody at a time when the Johnson administration feels it must impose increasingly strict limits on non-Vietnam spending, even for urban programs; but the reasoning in the Dicke panel's succinct and eloquent report is less fiscal than technical.

The report looked forward specifically to later instruments of greater resolution and sensitivity—and cost. For NSF and for its patrons in the executive and legislative branches, the panel spelled out its reasoning in simple language:

"It has been evident for several years that major—even 'breakthrough' improvements of radio telescopes costing 20 to 50 million dollars are within present engineering capability. Those improvements represent increases of orders of magnitude in both resolution and sensitivity. Resolution allows the radio astronomer to separate one object from another and, further, to map the characteristic features of a given object. Sensitivity allows faint and distant objects to be observed. The combination of recognition of characteristic features and observation of the faintest objects offers a reasonable expectation that the new radio telescopes can observe the 'boundedness' of our