Technology for the community

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Karl Hess

Scientists make good neighbors," says Karl Hess, "but you have to work at being a good neighbor." Hess and a group of similarly minded scientists are trying to do that. Known to the "outside" world as a lecturer-writer and a fellow of the Institute of Policy Studies in Washington, D.C. Hess is known in the ghetto area of Washington in which he lives as a welder. "Scientists have to be practical people. They have a life in the community as well as a life in the mind," he believes.

Two years ago Hess and his friends initiated a project called Community Technology to put his ideas into practice. The purposes of Community Technology, according to its own description, are "to de-mystify technology, to challenge all of the claimed economies of scale, and to push as far as possible practical demonstrations of high technology in the direct service of human needs and imagination in an urban community." The group, according to Hess, is one of about six organizations in the world (though most of the others are rural, not urban) engaged in developing "soft" technology. (Soft technology, as opposed to hard, does not place stresses on the environment, is low in its capital demands, frugal in its use of resources, and, as defined by Hess's group, is physically contained within the community so that the people themselves can determine its impact on the neighborhood.) But scientists' efforts to be good neighbors, Hess feels, by and large fall on deaf ears. "Scientists are among the least listened to, least rewarded in society. They have no voice. Some people say we need to make humanists out of scientists. I'd say, rather, we need to make scientists out of humanists. Science should be a conscious part of everyday life."

The facts are to the contrary. New test scores from the National Assessment of Educational Progress indicate that science knowledge declined two percent during the first three years of this decade among schoolchildren, after 15 years of effort to raise the quality of science education in U.S. schools. In addition, over the past ten years the National Science Foundation has had its education budget cut nearly in half. Government and private spending for research and development of new technology began dropping in 1967 and has only recently begun to recover. Scientists have the role of informing the public, Hess believes.

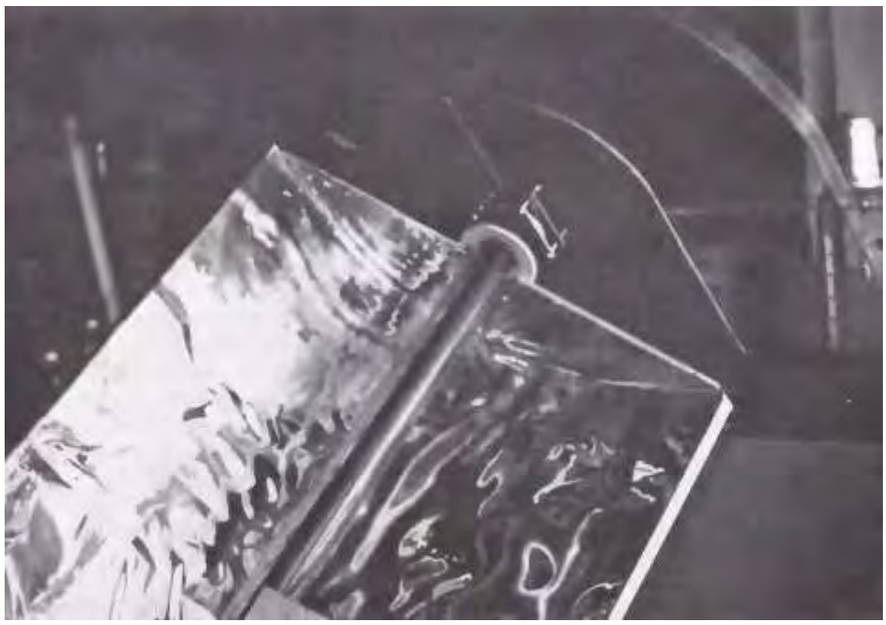
"Ordinary people can grasp technical details," he says. "The major fight against nuclear power plants was conducted by self-taught people. A grasp of the fundamental 'laws of particle physics is possible and should be had by all. It's as important today as a knowledge of rearing horses was 100 years ago." Community Technology, besides being affiliated with the local community organization, keeps in touch with its community through a newsletter, Science in the Neighborhood, and weekly meetings open to all comers. Their workshop, a warehouse leased to them free by Children's Hospital of Washington, is open for school tours, and neighborhood kids often drop in.

The dimly-lit, cluttered workshop houses a variety of experimental projects. A demonstrator solar concentrator is hooked up to a coffeepot. One current project, just getting started, is to equip a house in the community for solar energy. A waste disposal system in which bacteria break down the stored wastes, sits in a closet. A solar water pump suitable for, as an example, irrigating relatively flat land, is also being developed.

In a large, air-conditioned room, rainbow trout are being raised in a tank which could be operated in a basement. Designed by a chemist in the group, the system employs a bacteriological technique for purifying and recirculating the tank water, thereby reducing its water consumption to less than a thousandth of that of commercial, through-flow fish farms. The prototype system produces five pounds of fish per cubic foot of water, at a cost in energy and feed of less than $1.00 per edible pound. (The fish retail locally at about $2.25 a pound). Trout are a cold-water fish so they cost more. Hess would like to see them try catfish next, a warm-water fish. "The deal would be to raise catfish in the warm months and trout in the cold."

The "solar kitchen" that converts the sun's rays into heat for cooking was designed by a group member who was formerly the senior design engineer for the Atlas missile propulsion system. He is also working on a solar collector for home water heating that could be easy and• cheap to build by local individuals or

cooperatives.



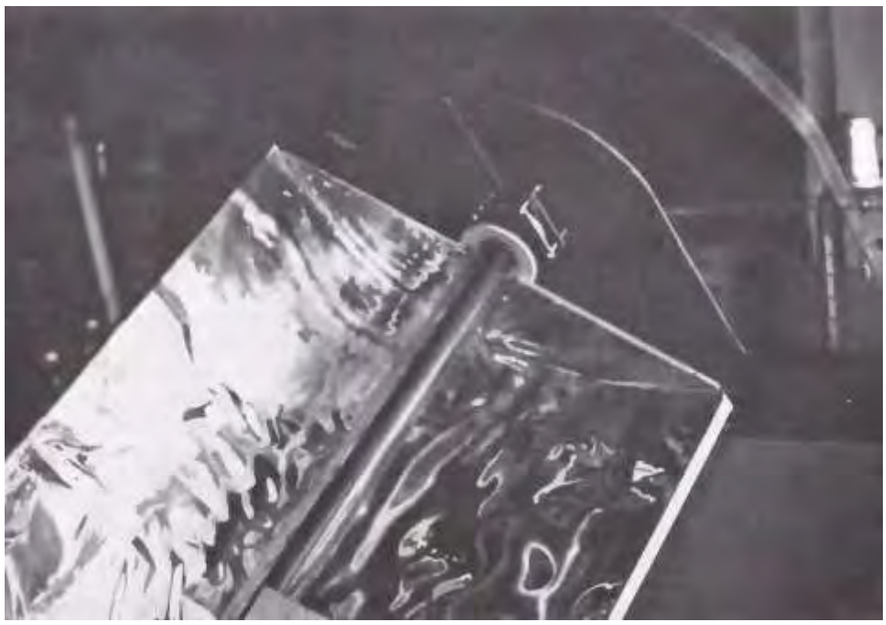
A tank like this could produce five pounds of fish per cubic foot of water in your basement

The Hesses raise a rooftop vegetable garden, and the warehouse's backyard is also divided up into small plots for community residents. Seedlings are sprouted in paper cups on the windowsill inside. Another member is designing a rooftop greenhouse and is studying the feasibility of year-round hydroponic gardening for rooftops that could not sustain the weight of a regular potted garden.

"The technology of the Green Revolution is questionable," Hess states. It results in high fertilizer and pesticide costs, delicate varieties, and reduced protein content. "It could only be adopted widely by 'bookkeepers,' i.e. the government. As a result of it, small farms are being bankrupted, and we see extensive blighting. You get higher production, but of grains with diminishing protein yield. Twelve to fifteen calories of energy go into every calorie of food we produce.

The prevailing ideology favors bigness, growth, but physical facts are in favor of smallness, diversity, and frugal raw materials policies. Ecological systems are very diverse. The more complex a forest is, the lusher it is."

Hess listed a number of other sources of energy preferable to petro-chemicals or even atomic energy. Offshore drilling rigs, Hess points out, which many hope will solve the energy crunch, themselves require huge amounts of energy. Nuclear plants are also deficit energy producers, consuming more energy than they produce.



This solar collector produces enough heat to boil water in the coffeepot at rear

"Bamboo is a great fuel -- it can be grown in greenhouses and it's renewable." Other sources are the use of agricultural wastes through combustion or their conversion to alcohol, sewage, wood, geothermal or tidal

energy, and solar energy.

Solar energy has been working for years, Hess says. "There is no technical reason for not doing these things. It costs money initially, but solar energy is largely maintenance-free and cost-free. You'd need some supplemental heating, but in Washington, for example, solar energy could be 70 percent of the answer."

A Woods Hole Oceanographic Institute project in Falmouth, Massachusetts, is demonstrating a sewage-disposal system that has the potential to also reduce environmental pollution and increase the country's food supply all at the same time. Each day some 10,000 gallons of sewage from local areas is trucked to an experimental plant and mixed in large tanks with sea water. Algae feed on the wastes, extracting de-composition products.

The algae then is fed to oysters in the next tank. Water is then passed over filtering seaweed before being released, using seaweeds with commercial potential. Early studies on the feasibility of a mass system show that the sewage from a city of 50,000 people could be purified, grow a quarter of a million bushels of shellfish a year, and yield a yet undetermined quantity of commercial byproducts.

This is the kind of system Hess would most likely approve. "It's hard to change attitudes," Hess admits. "You have to change education, and that won't happen unless something drastic occurs. But change has to come sooner or later." However, scientists and engineers are fairly well distributed in the population, and if more and more people recognize that "scientists make good neighbors," we might see changes like those in Washington, D.C., and Falmouth, Mass., becoming more and more prevalent.