adults. Are there really enough older people around with the good will and energy required to help other people's children to grow up? What seems to be asked for is a whole new stratum of teacher-counselor-community worker. Professionalization, bureaucratization, and unionization of the public schools in recent years suggest that providing alternative community forms, which is what the recommendations of the report amount to, will not be easy.

Coleman concedes that "It is possible to argue that young people are happier when they don't have older people around," and that older people feel the same way about the young. He finds opposing evidence, however, in work-study programs, for example, where young people show up at work even when they avoid school.

"It's a very open question," nevertheless, Coleman says, "and it could be answered in an age-segregating way. Let's assume that young people don't want to be with adults and vice versa. We should ask ourselves collectively as a society if we can afford that kind of an arrangement. If you look at animal societies, you never see a case of extremely strict segregation of youth and adults. We may end up with an age-segregated society, but we should go into it with our eyes open and having tried the alternatives."

—JOHN WALSH

Sweden: Naderism Blooms in the North Country

Americans don't usually think of Sweden as a nation of smoggy skies, mutagenic food additives, and proliferating nuclear power plants. On the contrary, Sweden's image is that of an environmentally attuned nation where the government has shown vigilance in such matters as control of pesticides. But if one can believe Björn Gillberg, a microbiologist-turned-geneticist who in recent years has earned the title of the Ralph Nader of Sweden, Sweden's image as a clean country is a "sham," and its government, usually painted as operating a benign social welfare state, is unconcerned about the people's health and safety.

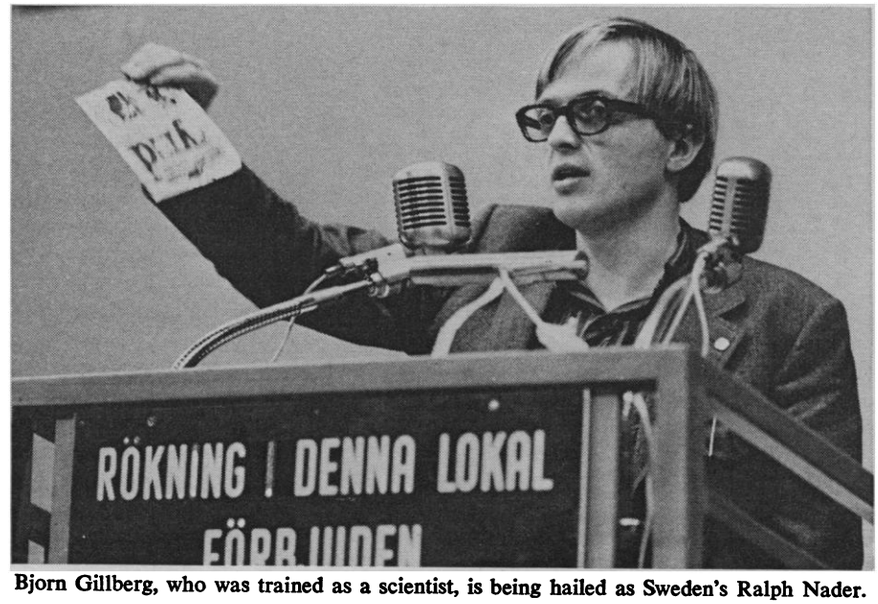
Gillberg is an intense and talkative man of 30, with an apparently infinite capacity for outrage about environmental and consumer problems. Interviewed on a recent visit to this country, he discussed his movement (which even his critics admit is substantial), the obstacles it faces in Sweden, and its successes since Gillberg became widely known with the publication of a controversial book in 1969.

Among Americans and Swedes familiar with his activities, there seems to be agreement that Gillberg, although controversial, is successfully so. Alan McGowan, president of Scientists' Institute for Public Information, says, "I think he has the esteem of a large number of people, including Swedish scientists who can't challenge his scientific veracity. He's a good researcher and he has his facts straight when he talks." One Swede, asked about Gillberg recently, replied by shaking his head: "He's outside the establishment you know." He added, "But Gillberg has been effective."

Parallels with Nader are not hard to find. While completing his dissertation in genetics at the University of Uppsala, Gillberg wrote a book about genetics which included sections on possible poisons in the environment. *Threatened Generations*,* as it is called, was published in 1969. A Swedish magazine later said it "created a storm in Swedish society." It also thrust Gillberg into the public spotlight, lecturing and writing on the theme of government mishandling of environmental and consumer problems.

Threatened Generations may or may not have been the Swedish equivalent of *Unsafe at Any Speed*—Nader's first major book—but according to Gillberg, just as General Motors tried to harass and discredit Nader, the Swedish government sought to undercut him. In 1971, STU, a government technical advisory board, refused to renew funds for Gillberg's research on nitrogen-fixing bacteria and their use in fertilizing soil. The official explanation was that Gillberg's work, which would be largely applicable to farmers in developing countries, did not conform to the STU's general goals. Moreover, "The interest shown earlier by the Swedish industry was no longer at

* Not available in English.



Bjorn Gillberg, who was trained as a scientist, is being hailed as Sweden's Ralph Nader.

Blood Bankers Pressured to Unite

For the past year and a half the Department of Health, Education, and Welfare has been trying to figure out how to push the nation's blood-banking systems into a coherent pattern. So last month, HEW called together a variety of medical and consumer groups for a daylong brainstorming session to hammer out their differences and come up with the beginnings of a plan. They could do it any way they wanted, said HEW's Assistant Secretary for Health Charles Edwards, but it had to provide for regionalization of blood services, coordination between the major blood-banking organizations, development of cost-accounting procedures to make the cost of blood services consistent and reasonable throughout the country, and gradual movement toward an all-volunteer system of blood donation.

Edwards made it abundantly clear that, if the private sector can't come up with a decent plan of its own by the end of January, the federal government will have to step in and make things happen, either through new legislation or new federal regulations.

To show how serious the government is, HEW Secretary Caspar Weinberger addressed the meeting, Food and Drug Administration head Alexander Schmidt was there, and Edwards and Harry Meyer, head of FDA's Bureau of Biologics, sat through the whole thing.

By the end of the day, Edwards said that "frankly" he was "not particularly optimistic about bringing these groups together."

The problems are the same that have kept the blood business divided over the past 25 years (see *Science*, 24 and 31 March 1972): the country's two major blood networks, the Red Cross and the American Association of Blood Banks (AABB) simply don't see eye to eye. The Red Cross, concerned with the collection and processing of blood and its distribution to hospitals, believes that blood is a community resource and a community responsibility, that no cost should be attached to the substance itself, and that individuals should not be penalized for not replacing the blood they use. The AABB, most of whose members are hospital blood banks, believes that individual incentives are needed if adequate supplies are to be maintained. It therefore operates on a complicated system of blood credits and "nonreplacement fees," ranging from $15 on up per unit (on top of processing and transfusion costs), which are paid by patients who can't replace blood with blood.

One step has been made toward establishing a common organizational framework. The Red Cross and the Council on Community Blood Centers, the third major noncommercial organization, have agreed to set up an "American Blood Institute" that would serve as a forum for all interested groups to work with the government in reshaping the system. But the AABB doesn't agree with the goals of the proposed institute, which include elimination of the nonreplacement fee. It wants instead a "voluntary commission" on blood banks and transfusion services.

Edwards, appearing mildly exasperated after a huddle with representatives from the three groups, said he was giving them 2 weeks to come up with a plan for a plan.

Although, as Edwards pointed out, the Red Cross and the AABB have certain "rigidities and biases" that impede agreement, they have a lot in common. Both want to develop new strategies for recruitment of voluntary blood donors so there will be enough volunteer blood available to drive commercial banks out of business (paid blood is thought to be the source of over half the cases of posttransfusion hepatitis). And both are well aware that increased use of component therapy could reduce waste and stretch the available supply—in most transfusions frozen red cells could be substituted for whole blood, thus making plasma available for other purposes. Perhaps most important, no one, including HEW, wants the federal government to take the primary responsibility for organization and administration of blood services. So the private sectors may finally decide that some sacrifice of principle in the interest of compromise is warranted.—CONSTANCE HOLDEN

hand," said an official statement. But Gillberg says that having his research funds cut was "the best thing that could have happened" to him. He described how, in the aftermath, the news media took up the case. He also received letters of support, offers of volunteer help, and financial contributions. As a result, Gillberg founded the Miljöcentrum, or environment center. Based in Uppsala, the center has laboratory facilities of its own and publishes a newspaper, *Environment and Future*. Now Gillberg estimates there are 100 other, smaller centers in Sweden, 30 in Norway, and 60 in Denmark.

Thus, Gillberg was able to continue in an organized fashion his war against optical brighteners, which are added to detergents, body soaps, and some packaging to make things "whiter than white" as the ad says, but which are also suspected of causing allergies and genetic defects. Other Miljöcentrum campaigns have focused on glutamates added to baby foods (U.S. baby food manufacturers have voluntarily stopped using glutamates); on nitrates, used to redden meats; and on bisulfates, which are added to Swedish-style precooked packaged potatoes (bisulfates are prohibited in all U.S. foods). Gillberg has also taken on Sweden's large pulp and paper industry, alleging poor performance in combating pollution.

But changing national policy isn't easy in a country where the government operates one of the most extensive social welfare systems in the world (including compulsory health insurance and health care delivery), where the courts have relatively less power than they do in the United States, and where one political party, the Social Democrats, has been in control of both the Parliament and the executive branch of government for more than 40 years. Gillberg pointed out that under Swedish laws, a citizen cannot bring a "class action" suit against the government in the way that public interest groups in the United States can. Hence, with a few exceptions, the courts do not offer a way to change government policy or to redress consumer grievances.

Further, he said, the traditional institution for ironing out citizen's gripes in Sweden, the ombudsman, has proved less than effective. He described his and the Miljöcentrum's efforts to use the ombudsman's office at the height of the controversy in the media over nitrates in meat. The Miljöcentrum went to the ombudsman, noting conflicts between its data and the government

food agency's position that there was "no evidence" that rats injected with nitrates develop tumors. "The ombudsman said no . . . they said they have a lot of complaints from citizens and don't have time to take up all of them." But, said Gillberg, "With one television program, we got nitrates banned in Norway!" He said that his group was gathering documentation on appeals made to the ombudsman, who has a staff of about ten persons to investigate complaints in a country of 8 million people. "This kind of documentation is needed for new laws," he said. Recently, a second official ombudsman, specializing in consumer affairs, was named.

The best route to getting certain unsafe products off the market or undesirable policies changed in Sweden, Gillberg believes, is through public education, and thence, the parliament. Indeed, the environmentalists' greatest success has been a parliamentary one. Last May, the 350-member legislature passed a sweeping law calling for a moratorium on all nuclear power plant development until after a comprehensive review of the safety issues could be made. Although the law will allow completion of some nuclear power plants, observers of Swedish politics say the vote was significant, not the least because it was pushed through by a coalition of the Center and Communist parties against the ruling Social Democrats.

Given Sweden's long record of leadership in world organizations, one might expect a Swedish Ralph Nader to look to such organizations for help. However, Gillberg seems to have little faith in international groups at present. When the U.N. Conference on the Human Environment was hosted by the government in Stockholm last year, Gillberg says that he stayed in Uppsala and boycotted it, because the government's involvement in it was a "Chaplin farce." On the one hand, he says, a pollution-conscious Swedish public helped create a sympathetic setting for the meeting. But on the other hand, he scoffed, the Social Democrats hosted the conference "to appease people. They were also profiting from it themselves because they were getting a bad name," on pollution questions. It syphoned energy from his movement, he said.

Whether scoffing at government regulation of paper mills, or recalling how a cabinet minister once blurted out on television that he didn't care what was in the soap so long as he had a nice white shirt to wear, Gillberg portrays a Sweden very different from its usual image. Spokesmen for the Swedish government have indicated, however, that the government's environmental record is excellent. From this side of the Atlantic, of course, it is impossible to judge the merits of Gillberg's and the government's conflicting assessments. But the fact that Gillberg has the apparently respectful attention of a wide Swedish audience shows that Naderism is, to some extent, exportable.

—DEBORAH SHAPLEY

Sorghum: "Miracle" Grain for the World Protein Shortage?

The development of hardy strains of so-called "miracle" wheat, rice, and corn by plant scientists has made possible a dramatic rise in the production of cereals in less developed countries. Now, researchers at Purdue University have come up with a discovery which they believe could transform the lowly sorghum plant into an important source of protein for millions of the people who need it most.

The Purdue scientists have identified two strains of sorghum with a much higher lysine content than most other sorghum plants, and are working to develop seed stocks for wide use. An estimated 300 million people in the world now depend on sorghum for their "principal" food, according to the Agency for International Development (AID).

Sorghum is the cereal crop on which the very poorest people in the developing countries of Africa, East Asia, and India depend. It grows in arid and stony soil where wheat and corn cannot. It is a staple in the African region of Sahel, which this summer experienced a wide-scale drought and famine. Sorghum seeds are pounded into flour, which is then mixed with water to make mush or baked into crude bread; the stalks are used as thatch or for fuel. The sorghum usually grown in the United States is not a human food crop; it is used as feed for animals. The stalks of certain strains yield a kind of molasses. Even as fodder, its poor protein value requires that it be supplemented.

Sorghum's nutritional defects stem from the small amounts of lysine found in most of the 16,000 strains grown throughout the world. Lysine is one of the amino acids necessary to protein manufacture in the body. Thus the lack of lysine in sorghum limits the overall protein value of the grain. While screening some 10,000 varieties of sorghum from all over the world, the Purdue researchers found two Ethiopian strains with a single gene which remedies the lysine deficiency. Hence the plants have triple the protein value of normal sorghum. The researchers, including John D. Axtell, Dallas L. Oswalt, and Rameshwar Singh, performed the work on a $1.7 million contract with AID. They will publish the results in the forthcoming issue of *Crop Science*.

Axtell stated at an AID-sponsored press conference on 28 September that, by cross-breeding techniques, this gene could be added to strains of sorghum already used by farmers. And, since the people who depend on sorghum are also susceptible to kwashiorkor and other malnutrition-related diseases, the increased nutritive value of their sorghum diet could lessen the incidence of those diseases. At the press conference, John A. Hannah, the outgoing AID administrator, went a step farther and called the Purdue discovery one "of life-giving importance" to the 300 million people who depend on sorghum.

Moreover, the sorghum discovery will aid the very poorest people in less developed countries, those who have allegedly been bypassed by the green revolution. In developing countries, only the richer farmers grow wheat and corn. Critics of the green revolution have maintained that the so-called "miracle" crops require substantial