SCIENCE FOR THE PEOPLE

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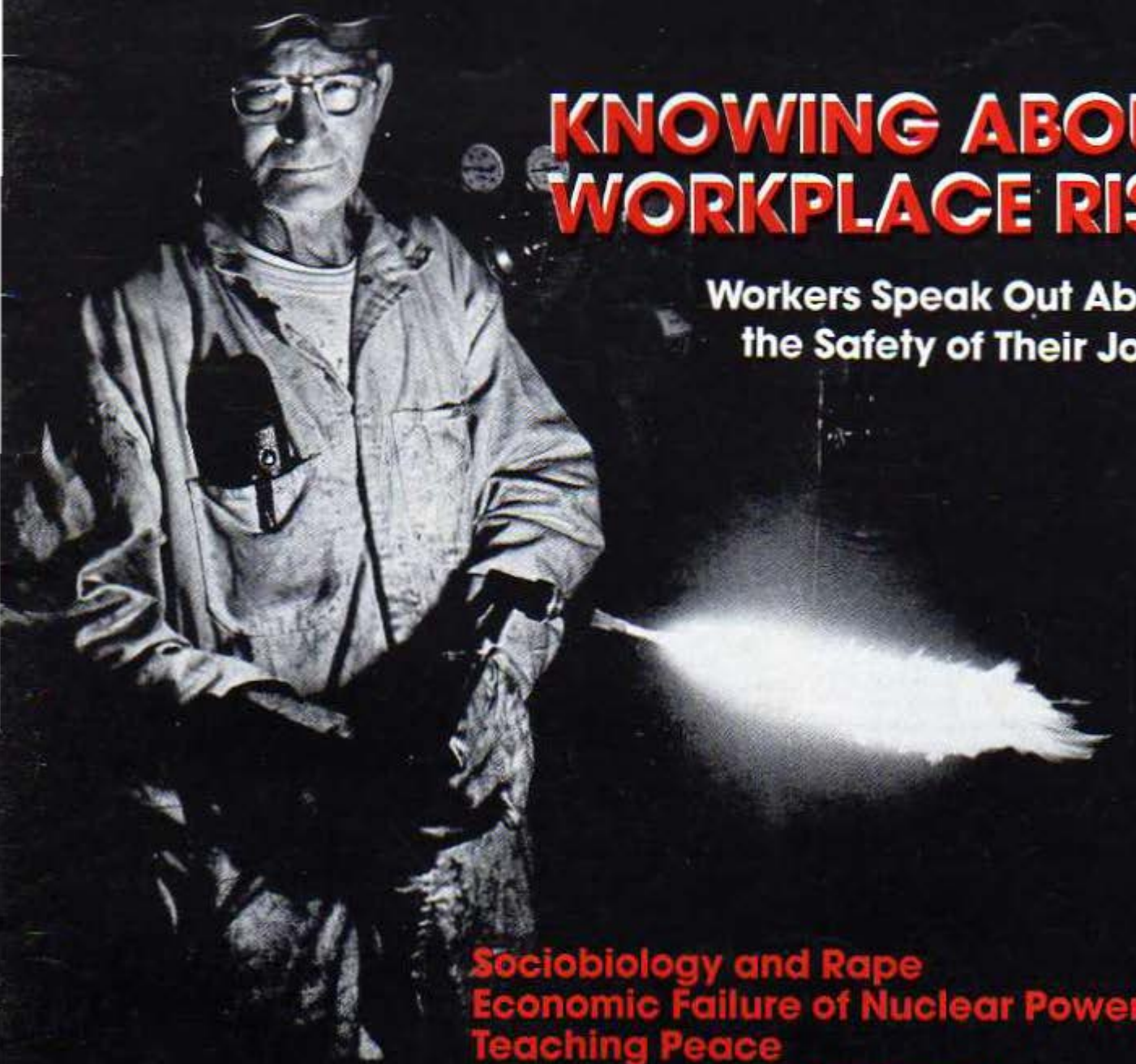

KNOWING ABOUT WORKPLACE RISKS

Workers Speak Out About the Safety of Their Jobs

Sociobiology and Rape
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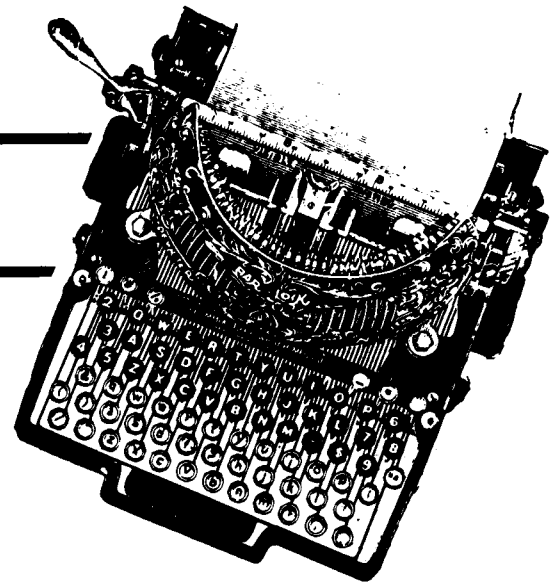
letters



ECOLOGICAL WARFARE

Dear SftP:

Your September-October issue is excellent, but I do have one objection to John Vandermeer's report from Vietnam, entitled "Ecological Warfare."

While Vandermeer's report is useful and interesting, it appears to be misdirected. He provides us with a lot of factual information about the Pentagon's defoliation operations in Vietnam, and he correctly defines it as a special kind of warfare, in this case "ecological warfare." Unfortunately, Vandermeer concludes his report with a call for a ban on ecological warfare. I think you should have pointed out to him that there is already such a ban.

On August 21, 1975, the U.S. and the Soviet Union tabled identical draft texts at the Geneva Committee on Disarmament for a "Convention on the Prohibition of Military or any other Hostile Use of Environmental Modification Techniques," commonly known as the Enmod Convention. This agreement was passed by the United Nations General Assembly and signed by more than 34 nations, including the U.S., on May 18, 1977.

On January 17, 1980, three days before Reagan's inauguration, the U.S. became a party to the Enmod Convention, thereby agreeing "not to engage in military or any other hostile use of environmental modification techniques having widespread, long-lasting or severe effects as the means of destruction, damage or injury to any other State Party."

The treaty defines "environmental modification techniques" to mean "any technique for changing — through the deliberate manipulation of natural processes — the dynamics, composition or structure of the Earth, including its biota, lithosphere, hydrosphere and atmosphere, or of outer space." An understanding attached to the convention specifically includes "an upset in the ecological balance of a region" as one of the many enmod techniques which are banned.

I would like to suggest that Vandermeer should have used the opportunity his article presented to call for reparations from the U.S. government for the ecological warfare already used against Vietnam. This took two forms, defoliation and weather modification, the effects of which are still being suffered by the Vietnamese people.

Please keep up the good work.

Chris Robinson,
Philadelphia, PA

NOTE FROM NORWAY

Dear SftP:

I'm a *TAP* subscriber and that's where I heard about *SftP.* I have found *SftP* to be very interesting, especially your recent Water Issue (Vol. 15 No. 4). It amazes me how industry can get away with dumping toxic waste all over the world. It sometimes seems that if someone kicks a dog people make a big fuss about it, but if someone dumps toxics that can kill thousands of people, no one really cares.

I'm glad to see you concentrating on these things that really matter in this world, like big industries and toxic waste. We don't hear much about these things over here and that's one of the reasons why *SftP* is so interesting. Please keep up the good work.

Carl C. Winter
Arendal, Norway

SPACE SHUTTLE

Dear SftP:

Thank you for your Sept/Oct Issue. Jack Manno's "Military History of the Space Shuttle" was an informative look at the military influence on our space program. As a longtime progressive activist, I have always had mixed feelings about our space program, especially the latest round of talk of commercialization of space. While other science magazines were busy glorifying NASA's 25th Anniversary, I was glad to see SftP telling it like it is. In this context I found Manno's ending warning to be a particularly important one: "the recent talk of space commercialization, industrialization and the routinization of spaceflight, no matter how well intentioned, will end up serving the military space program in the same capacity as the original NASA: a Trojan Horse concealing increasing militarization of space."

I hope this information can be made available to every person on the left that still has utopian visions of space colonies and peaceful uses of space in our lifetimes.

Jim Reeves
Portland, OR

UPCOMING ISSUE OF SFTP

The East Cost Editorial Committee is now soliciting articles for the July/August 1984 special issue on "Science and Policymaking/ Science and the Media." Please send articles, outlines, graphics and other material to: SCIENCE for the PEOPLE, 897 Main St., Cambridge, MA 02139.

SCIENCE FOR THE PEOPLE

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FEATURES:

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DEPARTMENTS:

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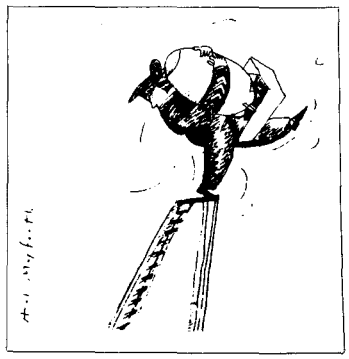
news notes

Defense Contractors Buy The Most Expensive Referendum in History

The city of Cambridge, Mass. was the unsuspecting host this fall to a battle between the giants of the nuclear weapons industry, local residents and disarmament activists. The issue was the Nuclear Free Cambridge Act, a binding voter referendum which, if approved, would have prohibited all research, development, testing and evaluation of nuclear weapons within the city. This ban would have primarily affected one company in Cambridge: Draper Laboratory, which last year did $120 million worth of defense work, including designing guidance systems for the Cruise, MX and Trident missiles.

The referendum was voted down on November 8 by a margin of 60% to 40%. But the vote count only tells part of the story. Citizens Against Research Bans (CARB), the group which formed to defeat the measure, spent $507,765.02 during its two and a half month existence trying to persuade Cambridge voters that they would jeopardize their jobs and risk throwing innocent workers and academics in jail if they supported the referendum. While promoting themselves as a grassroots "citizens campaign," CARB's recently released list of supporters reveals that they had only 27 contributions from individual donors—and only nine of those were Cambridge residents. The rest of their contributors reads like a "who's who" of the nuclear weapons industry: $25,000 each from Draper Labs, General Dynamics (builds parts of MX, Trident and Cruise missiles) and Sperry Corp. (Trident, Pershing and Cruise); $20,000 each from Northrop Corp. (MX, Cruise) and Rockwell International (MX, Trident, Cruise and B-1 Bomber); $10,000 from Martin-Marietta (MX, Pershing) and Honeywell (Pershing, Cruise), as well as help from many other notable American businesses.

Susan Levine of Boston Mobilization for Survival's Nuclear Free Cambridge Campaign pointed out that this campaign set a new record for the most expensive referendum campaign in American history, with CARB having spent $17.50 per Cambridge voter to make their case. This was invested in six direct mail campaigns, five television ads, numerous radio spots and newspaper ads and leafletting. The Nuclear Free Cambridge Campaign spent a total of



$23,000 in its efforts, raised primarily from hundreds of small contributions. Their organizing focused on a door-to-door canvass which covered the entire city twice, a telephone bank, leafletting, speaking and mobilizing a large number of volunteers.

Nuclear Free Cambridge organizers felt that the campaign was a success in many of the most important respects. "We were able to make this fall a public education forum in the city on the nature of the arms race, and did more to increase awareness on any issue since the Vietnam war," reflected Susan Levine. "We showed how a community can directly challenge how power operates in this country. The response of the weapons industry indicates that nuclear free zone organizing is really onto something."

Similar nuclear free zone referendums will go on the ballot in five other communities in 1984, including Ann Arbor, MI, Madison, WI and Berkeley, CA. Levine offered a word of advice to other referendum organizers: "We can't match their financial resources—we just won't win in those arenas. Our campaign task is to build strong community bases and large-scale grass roots organizations. That is where our strength ultimately lies."

—David Goodman

Organization Formed to Buy Poor Peoples' Kidneys

Thirteen years ago, in a booklet entitled *Towards a Science for the People*, the authors, affiliated with *SftP*, wrote:

"It is not overly visionary to imagine that society's underclass, whose labor is decreasingly in demand, might be nourished as a collective "organ bank." If this occurred, it would most probably be on a *de facto* rather than *de jure* basis, as is the case with other forms of class and racial oppression. That is, monetary and other incentives would be instituted to encourage "volunteers" so that direct coercion would be unnecessary. Models for the poor selling parts of their bodies already exist in the form of wet nurses, indigent professional blood donors, and convicts and colonial people serving as subjects for experiments."

It was with some interest that we noticed a *New York Times* article on this very subject. Apparently, a Virginia physician, Dr. H. Barry Jacobs, has formed an organization, the International Kidney Exchange, to purchase and market kidneys. Not surprisingly, perhaps, some of the kidneys would be "purchased from people living in underdeveloped countries."

Although Jacobs' license to practice medicine in Virginia was revoked in 1977 in conjunction with a Medicare mail fraud, officials of the National Kidney Foundation (NKF) have stated that there appears to be no legal method to prevent Jacobs from buying, importing and selling the human organs.

The establishment of Jacobs' organization has caused a good deal of controversy. Dr. David A. Ogden, president of the NKF, has termed it "immoral and unethical." In Congress, Rep. Albert Gore Jr. has introduced a bill that would outlaw the sale of human organs. Meanwhile, however, it seems this insidious form of oppression may proceed unchecked.

—information from *The New York Times.*

How Do You Spell "Gomorrah"?

Those who seek to reinsert religious instruction into public education suffered a setback in St. Louis recently. On October 11, the St. Louis Public School Board bowed to the demands of the American Civil Liberties Union and agreed to remove textbooks of bible stories from the elementary school curriculum. By that action the School Board rebuffed arguments that teaching biblical stories is teaching the basis of Western civilization and culture and not religion.

The textbooks in question purported to use biblical stories to teach *vocabulary*. Called the *+10 Vocabulary Booster Levels B and C,* the texts are used in hundreds of school districts across the country. The St. Louis Schools had used them for 15 years. Their author, Dr. William Kottmeyer, was Superintendent of the St. Louis Public School System from 1964 to 1970. Now he writes textbooks for McGraw-Hill Publishing Company.

The *+10 Vocabulary Booster Series* consists of five textbooks for the fourth through eighth grades. All of the fifth grade text and half of the sixth grade text consist of bible stories. Beginning with "The Creation" and passing through "The Flood," the destruction of Sodom and Gomorrah, Joshua commanding the Sun to stand still, and the reign of Solomon to "Israel Today," the texts carefully describe the bible stories as "the history of the Jewish people."

The beginning of the end for this "vocabulary" program came when a fifth grade student, Holly Strum, asked her mother, Elizabeth Bratton, for help with her vocabulary homework. Ms. Bratton, a member of SftP, says, "I was furious when I saw what they were teaching." The next day she began calling school officials to demand that they stop using the book. They replied, however, that the books did not teach religion, but "Western history and culture." The author of the text, Dr. Kottmeyer, went further. "Those texts," he said, "are the best single preparation for SAT tests. Studies have shown that they raise students IQ levels by an average of 10 points." Removing the books would, he added, "be the worst thing, educationally, for the children."

Faced with such responses, Ms. Bratton went to the American Civil Liberties Union of Eastern Missouri. The executive director there, Joyce Armstrong, agreed that the books taught religion. Two lawyers, Harold Hanke and Eugene Buder, agreed to handle the case. They had no more luck than had Ms. Bratton, until they filed suit. As the trial date approached, attorneys for the School Board began to negotiate seriously. Less than two weeks before the trial was to begin, and eleven months after Ms. Bratton first objected to the book, the School Board approved a resolution agreeing to remove the texts and stating that it had no intention of using them in the future. According to Ms. Bratton's daughters, Holly and Heather, the books have, in fact, been removed from their classes.

—Peter Downs

New Interest in Diet, Vitamins and Cancer

Recently, the journal *Science* (23 September, 1983) featured a cover story describing the existence of numerous carcinogens (cancer producers) and *anti*carcinogens that occur naturally in plants, including the important fruits and vegetables. According to current theories, many plants contain compounds that are metabolized to form oxygen radicals, that is, compounds containing oxygen and excess negative electrical charges. These oxygen radicals can react with DNA and cause mutations, which in turn can lead to cancer if genes regulating cell growth are altered. The anticarcinogens act as 'radical scavengers', reacting harmlessly with these oxygen radicals before they can damage the DNA. Prominent among the list of anticarcinogens were vitamins A, C, and E, as well as Selenium (a dietary mineral)!

CPF

The emergence of these important findings into the headlines of the scientific mainstream is a two-edged sword. They were used in this *Science* article to suggest that consuming pesticide residues on food may not be so bad after all, since plants already contain so many carcinogens. This reflects a common mistake in such 'cost-benefit' analyses, forgetting that one accepted risk never justifies another needless risk (see *SftP* 12:3,9). In this case, eating vegetables has obvious benefits while eating pesticides (which are often sprayed needlessly in the first place, see *SftP* 12:4,8) do not, except to chemical companies. Like smoking, diet may be blamed for cancers who origins may lie elsewhere, such as in the workplace or the larger environment. We must oppose such interpretations.

On the other hand, the findings are exciting for everyone who would rather see an emphasis on cancer prevention rather than the expensive, and often drastic methods favored by the medical establishment to cure or control cancer after it has appeared. These results should be widely cited to lend credibility, and fundability, to those studying diet as part of rational alternative health care. Now for cancer, as for heart disease before, some of the 'diet freaks' may have been right all along.

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"The Market Test"

NUCLEAR POWER'S FINANCIAL MELTDOWN IN THE U.S.

by Christopher Flavin

Thirty years have passed since U.S. nuclear officials said nuclear power would be "too cheap to meter."[1] It was an unfortunate claim that the nuclear industry now wishes had never been made. But these words will be long remembered, for they mark the beginning of a sad history of bold assertions and unsupported analysis that made the actual cost and economic merits of nuclear power extremely uncertain. Even today a full and fair accounting of the economic status of nuclear power is hard to find in any country. Some of the most misleading reports, unfortunately, come from government and industry offices that should have access to the most complete data.

The country that led the way into the age of nuclear power may very well lead the way out. The first signs of trouble for the U.S. nuclear industry came in the mid-1970s. Eleven nuclear projects were canceled in 1975 and another 32 from 1976 through 1979. During the same period only 13 nuclear plants were ordered. At the time, many energy analysts argued that this was a mid-course correction, a downward blip in nuclear power's healthy future. They were wrong. The early 1980s have witnessed a massive trimming of nuclear power programs by most of the country's utilities. Sixteen plants were canceled in 1980, the year after the Three Mile Island accident; six were canceled in 1981; and a record 18 in 1982.[2]

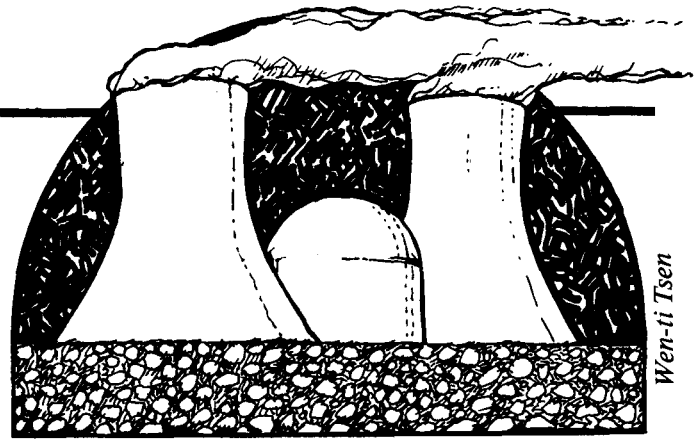
A total of 83 planned nuclear plants were eliminated in the United States between 1975 and November 1983, with a net loss in future generating capacity of 80,000 megawatts. The Tennessee Valley Authority eliminated 12 of the 17 nuclear plants it planned to build. The Public Service Electric and Gas Company of New Jersey canceled five of eight. The Duke Power Company canceled six of 13. Total cancellations represent 30% more nuclear capacity than the United States currently has operating, enough to meet the total electricity needs of any country except the Soviet Union and the United States.

Nuclear recession in the United States runs deep: only two nuclear plants ordered in the last nine years have not been subsequently canceled. (No work has been done on these two "phantom" plants and they are unlikely ever to be completed.) The first cancellations cost little since ground had not yet been broken for these plants. But in the last several years plants as much as 10 or 20% complete have been canceled. In 1982 alone, plants on which $5.7 billion had been spent were canceled, bringing the total bill for discontinued plants to $10 billion. Only by completing plants on the rapidly shrinking list of those that are less than half built could this trend be stopped.[3]

Behind the cancellations lie not only massive cost overruns but fundamental changes in the economic condition of the U.S. utility industry. High inflation and interest rates have made it more difficult to finance long-term, capital-intensive projects. Electricity demand growth has fallen from 7% per year a decade ago to between 1 and 3% today, greatly reducing the need for additional power plants. The persistent failure of utilities to forecast demand correctly and to alter plans soon after trends shifted has further hurt the financial condition of utilities. The Edison Electric Institute, which represents the U.S. utility industry, has overestimated electricity demand in each of its last nine annual forecasts. U.S. Department of Energy forecasters have been no more accurate, and their bullish 1983 long-term projection appears well out of line with current trends.[4]

Nuclear power's long lead times, staggering capital requirements and soaring cost overruns are particularly hard on utilities attempting to adapt to changed eco-

Chris Flavin is a senior researcher at the Worldwatch Institute and coauthor of Renewable Energy: The Power to Choose *(W.W. Norton, 1983). This article is adapted from his December 1983 Worldwatch Paper entitled: "Nuclear Power: The Market Test."*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nomic conditions. But nuclear projects also reveal inherent weaknesses in the curious blend of free market economics and bureaucratic decision-making that has severely tested U.S. energy policy. Between power generation and the consumer stand a maze of monopolistic companies, various layers of government regulation and special tax provisions that distort the decision-making process. It is a "free market" system that Adam Smith would hardly recognize and that few policymakers really understand.

Construction Costs:
Billion - Dollar Overruns The Norm

When the Grand Gulf 1 nuclear power plant was ordered in 1972, the Mississippi Power and Light Company estimated that it would cost about $300 million. In 1983 the plant began generating power several years behind schedule and *two and a half billion* dollars over budget. This figure is remarkable not just for its magnitude; it is also about average for the U.S. nuclear industry.

Nuclear power plants completed in the United States in the next few years will generally cost five to ten times as much as originally projected—overruns of more than $2 billion each. And some projects make that figure look like a bargain. The Limerick 1 plant in Pennsylvania is now budgeted at $3.4 billion, and the Nine Mile Point 2 plant in New York is expected to cost between $4.6 and $5.6 billion. Several recently canceled nuclear plants would have cost as much as $8 billion each had they been completed. Even the few "success stories" claimed by the U.S. nuclear industry, such as the Palo Verde plants in Arizona, are over budget and will cost at least $2.3 billion each. Nuclear economics is not for the fainthearted. The annual cost overruns alone equal the government budgets of many nations.[5]

The economic case for nuclear power became far more difficult to make as construction cost estimates for virtually every plant under construction climbed steadily during the late 1970s. In 1981, economist Charles Komanoff published a thorough assessment of cost trends in the nuclear industry. Using the utilities' own data, but carefully separating out the effects of inflation and interest rates, he concluded that real (inflation-adjusted) construction costs for nuclear plants had risen 142% between 1971 and 1978, or 13.5% annually. He found that coal plants were also becoming more expensive (largely due to added pollution control equipment) but at a much lower annual rate of 7.7 percent.[6]

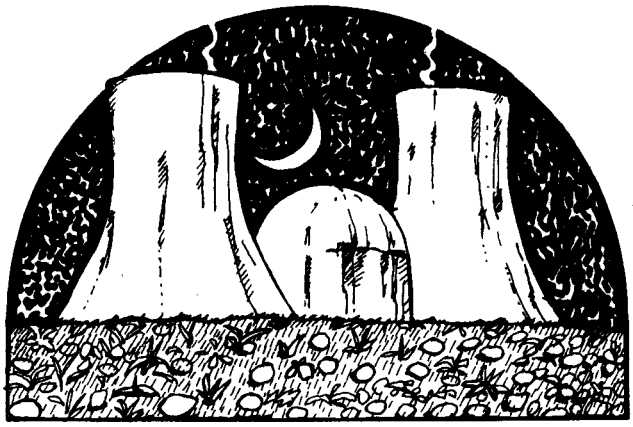
Because additional plants tend to reveal more technical problems that require more costly solutions, Komanoff projected that by the late 1980s nuclear plants would cost almost $1400 per kilowatt (1979 dollars) to build, or 75% more than coal plants completed at the same time. Originally nuclear plants were expected to cost 10 to 30% more than coal plants to build, but lower nuclear fuel costs were supposed to make nuclear power less expensive in the long run. A 75% construction cost margin, however, makes nuclear power barely economical at best. The nuclear industry vigorously disputed Komanoff's estimates, arguing that statistical analysis of the recent past does not reliably predict future trends.

Recent data shows that Komanoff's projections were conservative. Since the mid-1970s, cost estimates for individual nuclear plants have risen 20 percent annually on the average, or doubled every four years, faster than price increases for gasoline, housing or almost anything else. Nuclear plants completed in the mid-1980s will cost an average of almost $2,000 (1982 dollars) per kilowatt to build, or over 100% more than coal plants. And because of the high costs and long construction times, financing charges for a nuclear plant are now three times those for a coal plant and add $500 per kilowatt to the average construction bill.[7]

Operating costs for nuclear power plants, once expected to be negligible, have become another budget buster. A 1982 study by economists with the Energy Systems Research Group found that operation and maintenance (O&M) costs rose during the 1970s at an average annual rate of 18%.[8] By the early 1980s, nuclear plants cost an average of more than $30 million per year to operate (excluding fuel costs and major capital additions), enough to add 20% to the cost of nuclear power. Further O&M cost increases appear likely, particularly as plants age and systems deteriorate. Generic technical problems recently discovered in some nuclear plant designs, such as leaky steam generators and brittle reactor vessels, could result in repair bills of hundreds of millions of dollars. Only nuclear fuel costs have risen at a much slower rate. They add only about 10% to the cost of nuclear power and are one of the few factors in the economic equation not giving nightmares to utility executives.[9]

Operating Schedules: Less Than 60% Capacity on Average

U.S. nuclear power plants have also been hurt by erratic operating schedules. Plants have operated on average at less than 60% of their rated capacity in recent years rather than at 75 to 80% of rated capacity originally expected.[10] At fault are a range of technical problems that require operation at partial capacity as well as



Wen-ti Tsen

frequent shutdowns for repairs. Two-thirds of the cost of nuclear electricity comes from construction costs and interest that must be paid regardless of whether the plant is operating, and the Energy Systems Research Group estimates that a drop in capacity factor of 20 percentage points increases the cost of power by 30%. Coal plants have also run at about 60% of rated capacity, largely due to low power demand and resulting intentional cutbacks. But only a third of coal generation costs are capital costs, so the economic penalty is not nearly as great. Most of today's nuclear power plants are relatively new, and researchers are concerned that as plants age, deteriorating equipment may reduce capacity factors further. Salt water cooled reactors are particularly troublesome because they apparently suffer a significant decline in capacity factor as early as the seventh year of operation, presumably due to corrosion.[11]

Even government and industry officials are much less bullish on the economics of nuclear power than they once were. In industry boardrooms and at regulatory hearings, cost overruns are now frequently cited as a major problem confronting nuclear power. Lewis Perl, a utility industry consultant who bears responsibility for many reports extolling the economics of nuclear power, now says that, "Continued escalation in capital costs and operating cost for even a couple more years would wipe out the nuclear advantage (over coal)."[12] Although Perl's timing is wrong, his conclusion is essentially right. On the other hand, a 1982 U.S. Department of Energy (DOE) report concluded that for nuclear and coal plants completed in 1995, total generating costs would be about even, at between 3¢ and 5¢ per kilowatt-hour, depending on the region of the country.[13] While even proponents and critics agree that nuclear plants must verely biased in favor of nuclear power. It understates the real cost of nuclear plants now being completed and assumes without foundation that construction cost increases will slow drastically in the next few years.

Careful analysis of utility industry data for the 30-odd U.S. nuclear plants scheduled for completion in the mid-1980s shows that they will generate electricity at an average lifetime generating cost of between 10 cents and 12 cents per kilowatt-hour (1982 dollars). This is more than 65% above the cost of new coal-fired power and 25% higher than new oil-fired power, even assuming substantial oil price increases.[14] If all the electricity used by Americans cost as much as this nuclear electricity will, the nation's utility bills would rise about 130%.[15] As a source of heat, electricity from new nuclear plants at today's delivered cost compares with oil priced at $240 per barrel.[16]

Enough data exists to show conclusively that new nuclear power plants are not cost-effective in the United States compared to new coal plants. Even if all the unique safety and health dangers of nuclear power were removed, a U.S. utility planner choosing between a coal or nuclear power plant based solely on economics would have to select coal. Compared with energy efficiency improvements, nuclear power looks even less economically attractive. In addition, nuclear power carries financial risks that have struck terror into the hearts of many util-

Wen-ti Tsen

ity executives. S. David Freeman, a director of the Tennessee Valley Authority, which once had the largest nuclear construction program in the United States, concluded in 1982 that "The cost of nuclear power isn't just high, it's unpredictable. No sane capitalist is going to build something for which he can't derive a cost/benefit ratio because the cost is unknowable."[17]

Explanations for the rising cost of nuclear power provoke enormous disagreement. The nuclear manufacturers generally blame their woes on inept government regulation and a harsh economic climate, while nuclear critics blame inept mangagement or a flawed technology. All of these factors and several others play a role, but safety is almost certainly the single most important issue in understanding cost trends in the nuclear industry. Nuclear proponentsk and critics agree that nuclear plants must be safe to be a viable energy source, and the measures taken to improve safety account for a large share of

rising costs. From nuclear power's earliest days the cost of particular safeguards has provoked controversy. Many proposed regulations were not issued because of their potential economic impact according to a study by Daniel Ford of the Union of Concerned Scientists.[18]

Yet, due in part to public pressure, many safety standards have been established to date, to the point where today simply ensuring that all nuclear power plant systems meet required standards has become extremely complicated. Donald Brand, a vice-president for the Pacific Gas and Electric Company in California, describing the procedures for safety-related wiring in the Diablo Canyon plant, said, "For each circuit we can tell you what kind of wire was used, the names of the installing crew, the reel from which it came, the manufacturing test and production history. The tension on the wire when it is pulled is recorded and the tensioning device is calibrated on a periodic basis."[19] In West Germany a similar degree of documentation is required and has reportedly added significantly to costs. Operating experience, including faulty welds, stuck valves and mixed-up blueprints, has provided little reason for easing quality assurance standards.[20]

Figures for the past decade show that the amount of concrete, piping and cable used in an average nuclear plant has more than doubled and labor requirements have more than tripled. [21] Not all of the costs can be explained so easily, however. The changes needed to make nuclear plants safe affect not only discrete components but complex, interrelated systems. Often one change results in another, and so on. A study by the Atomic Industrial Forum in the U.S. noted that, "Attempts have been made on numerous occasions to pinpoint the full impact of regulatory changes on a nuclear project, and in each case it was found that the total impact was inevitably larger than the sum of the parts."[22]

Economist Charles Komanoff observed in his 1981 cost-trends study that, "Reactors were increasingly built in an 'environment of constant change' that precluded control or even estimation of costs and spurred endemic inefficiency in design and construction."[23] Many procedures were performed poorly by inexperienced workers, some had to be undone in order to allow for changes in other components, and construction crews often sat idle while waiting for parts to arrive or for supervisors to solve a difficult problem. Changes are made more complicated in the United States by literally scores of unique power plant designs, each of which must be individually evaluated and modified. Chronic inefficiency has become one of the chief trademarks of many nuclear industries.[24]

Regulation and Design Changes

The near-meltdown at the Three Mile Island nuclear plant in 1979 generated a new wave of changes in plant design and construction, even outside the United States. The accident revealed critical weaknesses in systems assumed to be sound. The pioneering nuclear physicist Alvin Weinberg reflected the general philosophy that emerged from the Three Mile Island accident when he said, "For nuclear energy to grow in usefullness, the accident probability per reactor will simply have to diminish."[25] Both industry officials and regulators looked more critically at plant design and found a wide range of generic technical problems that would have to be corrected at all plants to make them safe. Even today the changes continue, and most operating nuclear plants in the United States resemble construction sites. Marc Budaj, an engineer at New Jersey's Oyster Creek reactor, the first commercial plant in the United States, expressed the frustration of many in the nuclear industry in the early 1980s when he said, "When they are decommissioning this power plant, and pouring concrete in the reactor vessel, there'll still be some engineers out there installing field changes."[26]

One reason changes are so expensive is that many projects are mismanaged. The large engineering firms

Continued on p. 28

SOCIOBIOLOGY AND RAPE

by Val Dusek

During the last decade, an awareness of the issue of rape has grown, in large part influenced by the rise and spread of the women's liberation movement. Feminists have forced public attention to the issue of rape, its frequency, and the manner in which it is treated by the legal system. The women's movement has emphasized the threat of rape that all women in a sexist society face, while pointing out the anti-woman biases built into the traditional rape laws, and the discouraging and degrading treatment of rape victims by police and the courts. Yet despite some growth of awareness of the issue of rape, its incidence is still on the rise. The U.S. currently has one of the highest rates of nonwarfare-related rape of any industrial society, with a 30% increase in the incidence of rape over the last five years.[1]

Sociobiology also arose and grew alongside the women's movement. Sociobiologists have claimed that their "new science" legitimates everything from the traditional sexual division of labor to antagonism towards affirmative action, all on "natural scientific" grounds. Yet one of the most blatant and obvious contemporary examples of the use of the authority of science to justify oppresson and intimidation is the literature on rape by sociobiologists. Many sociobiologists use their theory to give an account of rape which legitimates most of the traditional attitudes about rape and which gives "scientific" respectability to many of the traditional rape laws and legal procedures.

The Methodology of the Sociobiologists

Sociobiology claims to be the study of the biological evolution of social behavior in animals, including humans. Its central thesis is that behaviors which maximize "inclusive fitness" are selected for. Inclusive fitness is a measure of the survival of the genetic basis of behavior among any individual and its close relatives. Behaviors are selected for and survive which contribute to the production and survival of the largest numbers of individuals with the genes of the individual who exhibited the behavior.[2] It is in this context that sociobiologists claim that rape is "natural" and selected for. Downplaying the role of social and cultural factors in encouraging and perpetuating rape, sociobiologists claim that rape is not a peculiarly human social phenomenon but that it is widely found among animals and even plants.

David Barash writes:

> In her book *Against Our Will* Susan Brownmiller claimed that only human beings engage in rape. The facts are otherwise. Rape is common among the birds and the bees.[3]

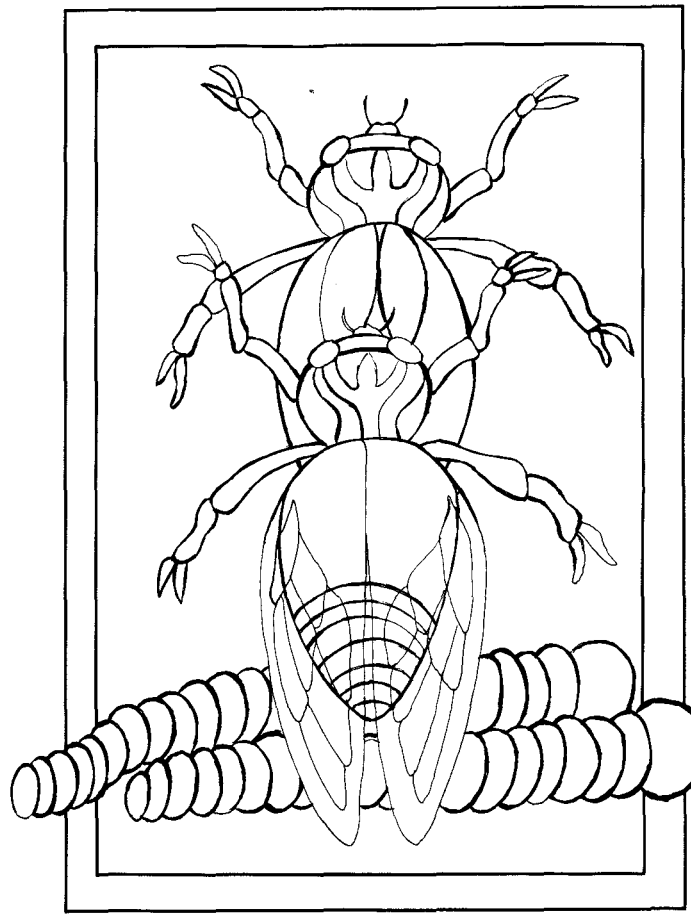
Sociobiologists do not directly advocate rape or say that "rape is good." Indeed some even condemn it. Instead, they argue that rape is a "natural" rather than a cultural phenomenon. Their legitimization of rape is more subtle: to the extent that a behavior is inherited, biologically given or programmed, they argue, purely social and psychological attempts to eliminate it will be ineffective. In this particular case, sociobiologists claim that rape is primarily a "strategy" for reproduction and, further, that it is an erotic rather than a violent act, thereby nullifying educative attempts of the anti-rape movement to the contrary.

Sociobiologists also portray rape as a biological propensity artificially held in check by social institutions. With their claim that rape occurs widely among plants and animals, and their selection of rape-prone human societies as exemplifying "natural" human tendencies, they oppose the view that rape is fostered or discouraged by nonbiological cultural arrangements. *Science Digest* tells its readers that, "biologist Randy Thornhill, of the University of New Mexico, and anthropologist Nancy Wilmsen Thornhill suggest that rape may be genetically programmed into male behavior among both humans and non-humans."[4]

Val Dusek is a longstanding member of the SftP *Sociobiology Study Group. He teaches philosophy at the University of New Hampshire.* *This article is a collaborative effort by all members of the Sociobiology Study Group. The author expresses special thanks to Jon Beckwith, Bob Lange, and Tony Leeds, for references, suggestions and criticism.*

Sociobiologists present no real evidence for their claims that "rape" occurs among plants, scorpionflies, ducks, etc., nor do they produce or even pretend to produce any evidence that human rape is genetically programmed. They not only misrepresent the nature of rape in general but they ignore a large body of evidence concerning the variability of rape among human populations or between different historical situations within the same population. In order to make their case, they resort to extraordinary misuse of language in describing the phenomena among plants and animals which they observe. They also carefully select from among the million or more species of living things those that will facilitate the case they wish to make about the "naturalness" of rape among humans.

The methodology in the sociobiological writings on rape is representative of that of the field as a whole. Cultural characteristics, institutions, and behaviors are projected onto nature. These characteristics, such as selfishness, racial antagonism, hierarchy, violence, rape, etc. are a selected subset of human cultural characteristics which illustrate the view of human life implicit in sociobiology. By distortion and misuse of language, these human cultural characteristics are attributed to nature, often in farfetched or questionable examples. These "examples" are then used to *explain* the very human behaviors from which they were originally borrowed. The resulting description and explanation of human society serves to support various widespread beliefs and attitudes which reinforce the established power relations of society.



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Beware the Rapist Worm:
Sociobiologists on "Rape" Among Animals

The sociobiologists' writings and their pronouncements to the media are allegedly based on "objective" animal research. However, the selection of examples used to support sociobiological arguments are not random. The misuse of such terms as "rape," "homosexuality," "prostitution" and "transvestitism" all of which are clearly cultural and and value laden, is evident in the way that these terms are haphazardly applied to animals and even plants. Sociobiologists often give the impression that rape is common in the animal world. However, even by the very lax criteria of the sociobiologists, "rape" turns out to be exceedingly rare.[5]

When we examine the examples of "rape," the claims of the sociobiologists rapidly begin to disintegrate. The acanthocephalan worm and the bedbug, for example, are claimed to engage in "homosexual rape." The use of this phrase is doubly misleading. Not only is the term "rape" being applied to organisms to which even the most anthropomorphic observer would not attribute cultural norms or willing consent, but the term "homosexual" is used for behaviors which have nothing to do with homosexual behavior. In one case, that of spiny-headed worms, the so-called "rape" of one male by another is a matter of plugging the competing male's sperm duct. The "rapist" worm does not issue sperm but only the plug in order to prevent the other male from fertilizing females. Thus the rape is not even sexual intercourse.[6] In the case of the bug, *X. Maculopenis*, the "rapist" is actually indirectly fertilizing a female by injecting the sperm storage organs of another male with its own sperm, even while the other bug is copulating. This is obviously a more or less indirect way of heterosexually reproducing, and has little if anything to do with human homosexual intercourse or homosexual rape.

An interesting sidelight on the relations between the mass media and sociobiology occurs in this case. The story of "The Oversexed Bedbug" was immediately picked up by *Newsweek*.[7] Subsequently, Sociobiologist Randy Thornhill in surveying the data for his "General Rape Hypothesis" cites not the original research paper, but the anonymous *Newsweek* article.[8] Thus not only do sociobiological research papers immediately gain publicity in the media, but the popular media articles have begun to feed back into the "technical" sociobiological research itself.

Randy Thornhill uses his work on scorpionflies to generalize about rape among human beings in American society. Yet Thornhill's characterization of rape depends upon his own estimate of what is "normal" in matings of scorpionflies. For example, Thornhill claims to

"clearly distinguish female coyness from rape."[9] In scorpionflies, the male ordinarily presents food to a female and the female consumes the food during copulation. Males who do not present food, and whom the female rejects by not assuming the mating posture and attempting flight, are characterized by Thornhill as rapists. As is true of most sociobiologists, Thornhill ignores that the patterns of behavior before mating in humans are highly structured by cultural conventions and do not follow a rigidly patterned innate sequence of behaviors. In this characteristic example, by generalizing to human societies, Thornhill disregards the difference between culturally variable human norms which are purposively broken by the human rapist and the highly stereotyped and instinctively patterned courtship dances of insect species.

DOWNPLAYING THE ROLE OF SOCIAL AND CULTURAL FACTORS IN ENCOURAGING AND PERPETUATING RAPE, SOCIOBIOLOGISTS CLAIM THAT RAPE IS NOT A PECULIARLY HUMAN SOCIAL PHENOMENON BUT THAT IT IS WIDELY FOUND AMONG ANIMALS AND EVEN PLANTS.

While Thornhill calls male insects which attempt to mate without offering food "rapists," sociobiologist Larry Wolf designates as "prostitutes" those female birds that he believes mate in order to receive food, rather than to reproduce. Wolf describes "prostitution" among hummingbirds, and his work is popularized in *Psychology Today* by the indefatigable animal sexologist, David Barash.[10] In hummingbirds, females that mate outside of the normal breeding season, thereby gaining access to flowers, are called "prostitutes."[11] The same females that mate and receive access to flowers during breeding season are not "prostitutes." Notice that what counts as prostitution in hummingbirds and what counts as rape in scorpionflies depends on whether the exchange of food during mating is considered normal or not.

Wolf's tacit assumption in his research on hummingbirds is that females should mate only to reproduce. There seems to be a kind of puritanism among these pious sociobiological pornographers of the animal world, especially with respect to female sexuality, which is not inconsistent with much traditional sexism. But Wolf is also disturbed by the behavior of the male hummingbirds. Since they receive neither economic benefits nor offspring from mating before the mating season, he can find no rationale for their mating. He suggests that they may be "parasitized" by the females! According to this terminology, human prostitutes who do not use birth control or abortion and so reproduce are no longer prostitutes.

Thornhill further enriches the imaginary landscape of the sociobiologists by finding "transvestitism" among the hangingflies, close relatives of the scorpionflies. Transvestites in this context are males who manage to abscond with the food offerings of other males by assuming the female mating position.[12] Since this act, like the supposed homosexuality of worms and bugs, is a means to heterosexual mating, its relation to the phenomenon of transvestitism in humans is specious once again.

There are several species of fish which sociobiologists claim engage in rape. This turns out to have even less to do with rape than one might expect, even given the previous examples. In the fish species in question, fertilization is external. The female first lays the eggs in a nest, and the male then swims above the eggs and secretes its sperm.[13] In some species of fish, sometimes males which did not engage in the initial mating display and/or were not involved in the digging of the nest swim over at the appropriate moment and manage to fertilize some or all of the eggs. These are called "rapists" by sociobiologists. No force or coercion is used, and there is no escape behavior on the part of the female (who may at the moment of "rape" have swum some distance away). Once again the parallels to human rape are lacking. A reject from Shockley's sperm bank of "geniuses" who surreptitiously placed his sperm in a test tube labeled by a Nobel Prize winner's name would be a rapist by this definition.

But of all the sociobiologists, David Barash, using mallard ducks as his subject, has probably done the most of any sociobiologist to popularize the notion that rape is widespread among animals and plants. Barash chides feminists with his claim that rape is "epidemic among mallard ducks."[14] Barash characterizes rape as mating in which the usual courtship sequence does not occur and in which there is struggle and escape behavior from the female. Once again such a characterization involves judgment as to what constitutes "normal" mating. "Normal" in this case is not merely a matter of statistical frequencies, as Barash claims to find rape to be very frequent among mallards.

Barash claims that male mallards will attempt to drive a "rapist" away from their mate in cases where the chances of repulsing the rapist are good. If the rapist succeeds, however, before the consort of the raped female is able to drive him off, then the consort will rape his own mate. Similarly, if a group of rapist mallards descends on the female and the original male is unable to drive them off or is obviously outnumbered, he will join the "gang rape." Barash interprets this as "All a Matter of Costs and Benefits" as the early *Psychology Today* report of his work was subtitled. The

original male performs a genetic cost-benefit calculation of his chances of producing offspring. Driving off the rapist is the preferred option; however, raping the already raped female will supposedly increase the original male's chances of reproduction.

Barash with his ducks, like Thornhill with his scorpionflies, audaciously leaps to conclusions about human beings. In his "Birdland" article, appearing in *Psychology Today*, Barash claims to find similar behavior among humans:

> And is it mere coincidence that when a woman is raped her husband or lover often responds by rejecting her (Mountain Bluebird style) or by being remarkably "turned on" (like the Mallard duck)?[15]

Barash, needless to say, gives no evidence that human males are turned on by their wife or lover being raped (or even that mallards are turned on by this situation). He simply seems to be reporting a very personal judgment on his part, his own fantasy as scientific fact.

Language in the Service of Ideology

One of the strategies by which sociobiologists are able to attribute politically significant human behaviors to the nonhuman creatures they describe is through their use (or, rather, misuse) of language. A variety of terms from ordinary language, such as "selfishness," "economics," "rape," and "prostitution" are applied to animals and plants. In some cases, these terms are recognized as metaphorical; for instance, in describing "selfish" genes or the "interests" of genes. These terms are claimed to be simply useful ways to communicate technical concepts, a mode of popularization. Such terms, however, often guide research, aid in the informal formulation of hypotheses, and function to select observations and bias conclusions.

Sometimes familiar words are given technical definitions. In many cases, however, the connotations of the familiar words are used. This is especially so when political conclusions are being drawn form biological theory. When M.T. Ghiselin concludes his book with "Scratch an altruist—and watch a hypocrite bleed," or when Garet Hardin and Dawkins use the phrase "Nice guys finish last," it is clear that they are taking the terminology of "selfishness" quite seriously in its human applications.[16]

In much of the sociobiological writing on rape, everyday words are used *without* any technical or precise definition and as a means of identifying quite diverse human and animal behaviors. For example, the significance in heterosexual rape of breaking the norms governing the treatment of members of the opposite sex is an important part of the crime. In many languages the word for violation is also used for rape. In many Indo-European languages the word for rape has the connotation of stealing.[17] The women's anti-rape movement has attempted to educate people that indeed rape is a crime of violence and not merely a matter of sexual immorality. Sociobiologists such as Barash and Donald Symons, however, describe rape primarily as an erotic act, and Symons argues at length against those who see the motivation to rape as a motivation to do violence.

Sociobiology in Action? Castration Option for Rapists

A judge in Anderson, South Carolina recently handed down a choice of sentences to three men convicted of rape: they could either spend thirty years in prison, or undergo surgical castration. The victim, who was raped for six hours in a motel room, as well as burned with a cigarette lighter, underwent what the judge termed the most "horrible" rape experience he had ever heard on the bench.

Reactions to the sentence have been varied. The judge has received positive responses from what *Boston Globe* columnist Ellen Goodman described as an "odd coalition" of law-and-order supporters and some feminists. Other members of the legal and feminist community have been strongly critical, feeling the sentence is barbaric, most likely unconstitutional, and not a deterrence to rape. Joy Bennett, executive director of the Greenville Rape Crisis Center, said: "The idea of castrating rapists does have a certain emotional appeal, and I know a lot of rape victims approve. But the fact is that rape is a crime of violence, not of sex. I'm afraid to have men like this out on the street."

While no references were made to any sociobiological theory of rape to support the judge's decisions, the underlying arguments are quite similar, and present a striking example of its potential concrete applications. The judge's assumption that castration would "take away the weapon" implies that the testicles contain the essence of what drives men to rape: sexual hormones, and sperm. The emphasis, then, is on rape as an erotic and a reproductive act. This is the argument of most sociobiologists, who have observed behavior they define as "rape" in animals to whom they assign particular libidinal and reproductive motivations. They then extrapolate from these studies and attribute these same motivations to humans. In doing so, they, along with South Carolina's Judge Pyle, have completely obviated the major theory of rape advocated by the women's movement. Rather than an outburst of perverted sexual desire that makes men rape, or an unconscious desire to preserve otherwise "lost" genes, the women's movement has stressed an understanding of rape as an act of violence and anger, emotions which cannot be removed by physical surgery.

The defendants have not made a decision on which sentence they will choose, as of this writing. The sentence is in the process of appeal. The *New York Times* (11/26/83) reported that, "at sentencing, [the defendants] were seriously considering the castration option, which would free them on probation for five years."

—Amy Shire

David Barash does not seem overly concerned about whether the behavior he calls "rape" among mallard ducks really is rape. He writes, ". . . If this is not rape, it is something very much like it."[18] Nevertheless, the use of this term is central to his research. Barash goes on to draw implications about the "naturalness" of rape among humans, and makes various unfounded extrapolations from his description of mallards' mating behavior to descriptions of *rape* in humans.

Donald Symons does start with a definition of rape which is part of the ordinary meaning of the term, copulation *without consent of the partner,* but he of course runs into the problem of divining consent and intention among worms, insects, etc. He dismisses this problem in a revealing way:

> The primary difficulty in deciding whether a given copulation between non-human animal species is "really" rape is the same difficulty that jurors in rape trials often face.[19]

Here Symon obnoxiously uses the fact that police, prosecutors, and jurors are often unsympathetic and prone to attribute desire or provocation to the rape victim to conclude that attributing rape to animals is no more problematic than attributing it to humans. Indeed Symons goes on to argue that because there is a "continuum" between consenting sex and rape there is no problem in attributing "rape" to various non-human creatures. But as one rape victim asked, "Who would consent to lying flat on her back in a dark alley in January?"[20]

If there is a clear example of the misuse of language and the twisting of definitions by the sociobiologists, however, it is in the case of the attribution of rape to plants by the ecologist Daniel Janzen, who, according to David Barash, is "one of our most creative ecologists."[21] Janzen may not himself wish to be classified as a sociobiologist, but his claim that plants "perform courtship displays, rape, promiscuity and fickleness just as do animals" is endorsed by David Barash and popularized in his book *The Whisperings Within*,[22] and by Fred Hapgood, the former Harvard News Bureau reporter who authored the book *Why Males Exist.*[23] In *Harpers* magazine, Hapgood claimed that Janzen must be correct since his work appears in a "professional journal," *The American Naturalist.*[24]

Janzen defines rape in plants as follows: if a female plant secretes a substance which prevents the pollen of certain varieties of male plants from fertilizing her, but a male plant of one of these varieties then develops a chemical associated with its pollen which makes possible the neutralizaiton of the pollen-incapacitating substance, then this male plant has "raped" the female plant. However, by applying Janzen's definition of rape to humans, intercourse between completely consenting human beings would count as rape if the physiological condition of a woman which ordinarily prevented fertilization failed to do so because of the chemical composition of a particular male's semen. This type of problem in generalizing to humans does not seem to bother sociobiologists like David Barash or Donald Symons, however.

IN ORDER TO MAKE THEIR CASE, SOCIOBIOLOGISTS RESORT TO EXTRAORDINARY MISUSE OF LANGUAGE IN DESCRIBING THE PHENOMENA AMONG PLANTS WHICH THEY OBSERVE. THEY ALSO CAREFULLY SELECT FROM AMONG THE MILLION OR MORE SPECIES OF LIVING THINGS THOSE THAT WILL FACILITATE THE CASE THEY WISH TO MAKE ABOUT THE "NATURALNESS" OF RAPE AMONG HUMANS.

Generalizations to Human Societies

As has been briefly illustrated, sociobiologists extrapolate or extend to human cultures the descriptions of plant and animal behavior which are already injected with anthropomorphic interpretation. This anthropomorphism is guided, of course, by the sociobiologists' vision of society. "Selfish" genes, rapist mallard duck cost-benefit analysts, bumblebee economists, and female hummingbird prostitutes all follow the principles of capitalist economics. And this capitalist vision is tied to sexism. The defense of sexual stereotypes co-exists with a calculating attitude toward sexual "strategies." Since a number of very diverse behaviors have already been misdescribed as rape by sociobiologists, it is easy for them to claim that rape in human cultures is merely one example of a universal animal phenomenon.

In order to make their case, the sociobiologists must describe rape in human populations in ways that fit the genetic cost-benefit analysis. They must argue or imply that rape is universal and uniform in human populations or else that the natural propensity to rape is constrained in some societies and at some historical periods by culture. Having done so, the sociobiologists claim that they have shown that rape is biological, not cultural. As biologists, the sociobiologists then become "experts" on rape.

Indeed, today sociobiologists are sought out by the media to dispense their expertise on rape. *Playboy* in "Why Men Rape" interviewed E.O. Wilson, while

Science Digest made do with Randy and Nancy Thornhill. By interviewing both members of a married couple, *Science Digest* can absolve itself of sexism, as did *Playboy* by using female authors in its six-month series on sociobiology.

In the U.S. many people are disturbed by recent trends such as the increase in rape. Perhaps *Playboy* and *Science Digest* calm their readers by explaining that violence and rape are biological universals and are not problems of the American culture of violence against women. The sociobiological understanding of rape as a *reproductive* strategy of low status males (rather than a social means to degrade and intimidate women) distorts the very nature of rape in general. It overlooks a whole range of cases which do not fit the sociobiologists' characterization of socioeconomic benefits. These cases include rape by wealthy, high-status, and married males; rape of women too old to reproduce; rape of prepubescent girls; murder-rapes; homosexual rape; oral and anal rape; rape involving coitus interruptus, etc., etc. Sociobiologists ignore these classes of cases, just as they ignore the cultural variability of rape, except after recent challenges by anthropologists.

"Mother Nature" as Sexist

Sexism and male chauvinism play a large role in sociobiology, both in the hypotheses and descriptions within the theory itself, and in the statements about public policy and social norms made by sociobiologists, including the media popularizations of sociobiological claims.

The first level of sexism in sociobiology is built into the theory itself. It structures the selection of animal species and behaviors to be studied and reported upon, with an implicit or explicit focus on their supposed similarity to human social activities. It structures the selection and description of the human societies which sociobiologists hold up as exemplifying "primitive" humanity, supposedly showing how our ancestors behaved. At the level of evolutionary theory in sociobiology, males are portrayed as active and competitive while females are presented as passively accepting the genes of inseminating males. At the level of selection of examples of species, sociobiologists select and describe for the most part those species whose behavior or social organization can be portrayed as exemplifying characteristics which are thought present in or desirable in human society. Irven de Vore described the militaristically organized and highly hierarchical, male-dominant baboons of the African plains while neglecting the baboons of the nearby forests which did not exemplify such male dominance or "military" organization.[26]

In the area of human society, sociobiologists select societies which exemplify traits such as warfare or rape which they regard as "natural" and "typical" of human nature, while ignoring or discounting societies which do not manifest those traits or manifest them to a lesser degree. The sociobiologists also present a view of human evolution which is highly selective and colored by their views of contemporary "human nature." Wilson, de Vore and other major sociobiologists emphasize the story of "Man the Hunter."[27] They then draw lessons for contemporary society, such as the claim that women are not "selected" for mobility and exploration or for intellectual or political activity. E.O. Wilson writes:

> Thus even with identical education and equal access to all professions, men are likely to continue to play a disproportionate role in political life, business and science.[28]

Statements such as this are examples of the last and most obvious level of sexism in sociobiology, the policy statements. Wilson claims that attempts to encourage women in science, business and politics will lead to inefficiency and will extract a social cost. Other sociobiologists are even more direct and unequivocal. David Barash states repeatedly that "Mother Nature" is a sexist,[29] Trivers goes so far as to suggest that feminists are headed for biological extinction.[30] But the sociobiologists do not have to draw the most sexist and reactionary conclusions from their work. They have already implied those conclusions by their choice of examples, the structure of their theories and hypotheses, and their misuse of language.

But aside from the sociobiologists themselves, the mass media picks up and propagates the "scientific findings" of sociobiology as well as their "authoritative" policy recommendations. In the U.S. particularly, the appeal to the "new science" of sociobiology in the popular news media as an authority to justify traditional views of the relationships between the sexes if far more widespread than in other societies. This may, among other things, be due to the power of the authority of science in matters of personal problems. That

SINCE A NUMBER OF VERY DIVERSE BEHAVIORS HAVE ALREADY BEEN MISDESCRIBED AS RAPE BY SOCIOBIOLOGISTS, IT IS EASY FOR THEM TO CLAIM THAT RAPE IN HUMAN CULTURES IS MERELY ONE EXAMPLE OF A UNIVERSAL ANIMAL PHENOMENON.

those who wish to defend power relations between the sexes which are challenged by the women's movement should make recourse to a new science that gives a stamp of scientific knowledge to sexist claims should not then be surprising.

The sociobiologists pose as scientists above the battle, but it is important to note that they do not disassociate themselves from the popularizations and political consequences drawn from their views. Wilson and Barash go further and claim that science has shown the errors of anarchism, feminism, and Marxism. In their statements concerning rape and violence against women, the sociobiologists not only impede social understanding, but they reinforce some of the most harmful and destructive sexist attitudes and actions in our society.

SOCIOBIOLOGISTS CLAIM THAT THEY HAVE SHOWN THAT RAPE IS BIOLOGICAL, NOT CULTURAL. AS BIOLOGISTS, THE SOCIOBIOLOGISTS THEN BECOME "EXPERTS" ON RAPE.

In analyzing rape, sociobiological theory ignores the social and psychological factors involved, the crucial elements which make rape an emotional and therefore uniquely human act. Its emphasis on rape as satisfying erotic and reproductive urges reduces rape to an instinctual behavior and belittles the rape experience. Sociobiology denies the overwhelming violence of rape, and in doing so, it legitimates a system of ideas concerning the naturalness of power imbalances between men and women that feminists have been struggling to dismantle since the inception of the women's movement. We need to understand the motivations for rape, not in a context which presumes them to be a biological fact of life and therefore immutable, but as a behavior whose roots are social and psychological, thereby allowing the possibility of change.□

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KNOWING ABOUT WORKPLACE RISKS:

Workers Speak Out About the Safety of Their Jobs

by Dorothy Nelkin and Michael Brown

Chemical products are indispensable to the modern industrial economy. Industry uses an estimated 63,000 commercial chemicals to create products ranging from pharmaceuticals to plastics, paints and pesticides. Unfortunately for the 4.6 million employees in the chemical and chemical products industries and others in occupations as varied as fire fighting, glass making and fine art, many of these chemicals are hazardous to human health. While the health hazards of the 1940s and 50s—asbestos, vinyl chloride, and benzidine dyes—are slowly being controlled, hundreds of new chemical products are introduced each year. Although industry as a whole may be cleaner and safer, conditions for many workers in a variety of jobs still involve exposure to dangerous chemicals.

Many Americans assume that the federal government takes responsibility for protecting the health of workers on the job. However, the current U.S. administration's regulatory philosophy is essentially to refrain from regulation of worker safety and to emphasize voluntary health and safety compliance by employers. Government staff and budget for monitoring compliance are limited, so that the government actually does very little to meet the needs of people on the shop floor. In effect, responsibility for providing a safe workplace falls to employers, who are not necessarily motivated to invest time, staff, and money in fulfilling that responsibility. In this deregulated environment, workers must vigilantly oversee their employers' efforts to comply with health and safety regulations. Thus workers are thrust into a watchdog role, which ideally requires that they be well informed about the health effects of their own work.

What do people know about the risks they face in their daily work? How do they obtain information? Knowledge about workplace risks is essential for making demands on an employer, for self-protection, and for generally coping with day-to-day risks. Yet, in order for workers to cope with chemical hazards, they need to assimilate a huge quantity of complex information. An ideally well-informed person would know about potential hazards, methods of monitoring exposure, acceptable exposure limits, and proper handling and emergency techniques. Relevant information includes the individual's health status and past exposure levels as well as the collective health status of those who have worked in the same plant.

This article examines workers' efforts to become informed, suggesting some of their strategies and the barriers that they face in obtaining information.

It is part of a study of the perceptions, concerns and behavior of people who work with chemicals.[1] Our research consisted of extended interviews with people who work with chemicals in a wide range of occupations. We wanted to understand their experiences and views on issues more often viewed through the statistical generalities of survey research.[2] The workers we interviewed were very concerned about obtaining information. Most of them knew little about the bewildering array of chemical substances they faced every workday. Many workers had access to materials safety data sheets, which are standard forms written by manufacturers, but found them inadequate because they rarely identified chronic hazards or provided monitoring or medical information. Some worked with materials identified by trade name and had no idea of the generic identity of the substances they were handling or their possible health effects.

Dorothy Nelkin teaches in the Science, Technology and Society Program at Cornell University, This past year she has been a visiting scholar at the Russell Sage Foundation in New York.

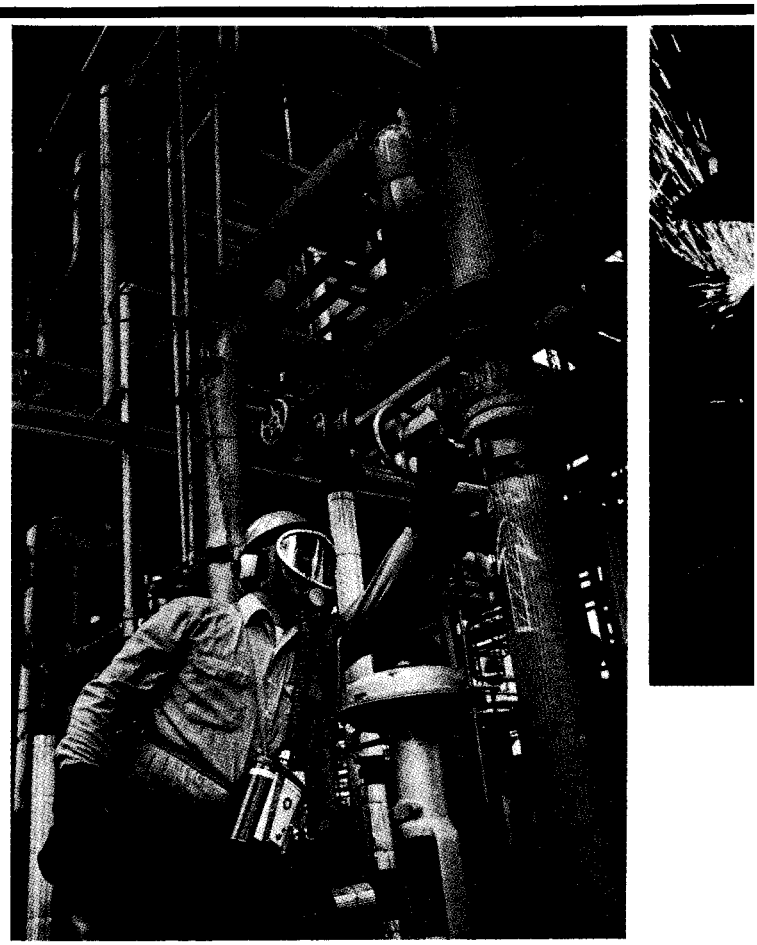
Michael Brown is a doctoral candidate in the S.T.S. Program at Cornell. This article is excerpted from the authors' forthcoming book, Workers at Risk: Voices from the Workplace, *University of Chicago Press, 1984.*

Strategies For Obtaining Information

Workers can pursue several strategies to find out about hazards. Some focus on the workplace, while others look to resources in the community and government agencies.

Workers seeking to extract information from management tend to rely on negotiating appropriate contract language and applicable government regulations. Aggressive unions may be able to bargain successfully for contract clauses specifying worker training and information rights. For example, the United Steel Workers negotiated such clauses into their contract with Republic Steel Co. in 1980.[3] The contract required management to notify the union of toxic substances used on the job, hazard data, air and noise sampling data, injury and illness statistics, and health and safety programs developed by management. In addition, the contract stipulated that management must provide worker training, including information about toxics, appropriate work practices, and rights under applicable laws and the collective bargaining agreement. Management was also required to notify individual workers if the company's physicians discovered any medical condition requiring further attention. Non-union workers and those without adequate contract language may request information under OSHA's access to records rule[4] and local right-to-know laws, if they exist.[5] The problem for many workers is that they must be aware of their rights and in a position to exercise them. Though discrimination against workers who use these rights is prohibited, there is a two year backlog of such discrimination cases that have not yet been heard.

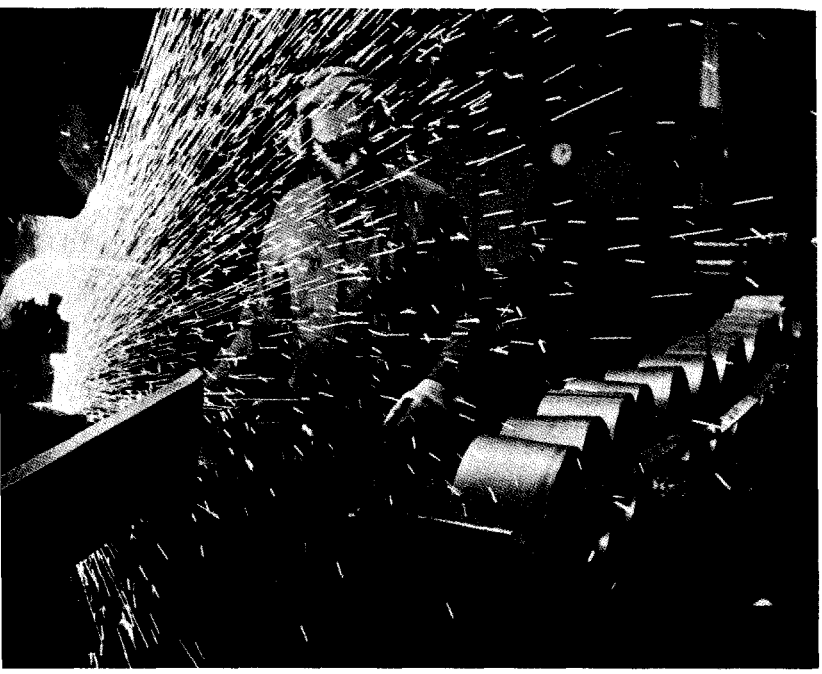
Other sources in the workplace include coworkers, health and safety committees, and government agencies. Knowledgeable coworkers are often responsible for training new employees. Some workers may serve as a general resource for an entire shop, providing health and safety information to coworkers and confronting coworkers and supervisors when their actions are responsible for creating hazards. Health and safety committees and safety representatives may provide information developed in the course of inspections (if they have the right to walk through the plant), or given to them by management. Some have organized workshops and epidemiological studies. The safety committee for one local brought in experts on reproductive hazards to meet with members and their spouses. They provided assistance on evaluating the chemicals used in the shop and collected data for a study.[6] OSHA and state agencies may be a

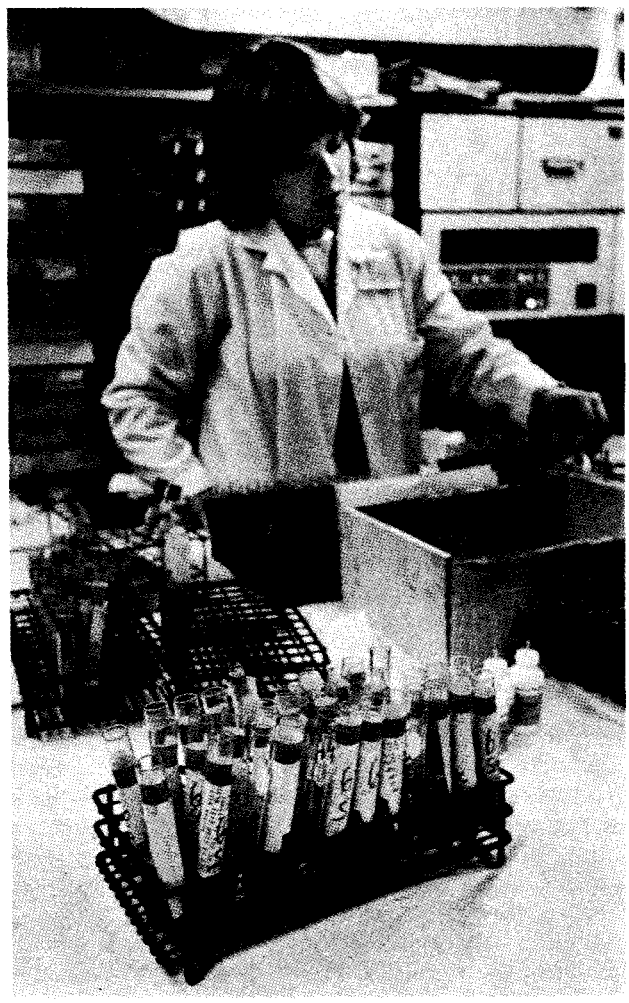


Don, railroad conductor: *All the conductors have to take the Commuter Awareness Program. It's a "How to Be Nice to People" course. They went to a lot of time and expense to get every trainman and conductor to a training center for one day to show them how to handle unruly or intoxicated passengers. If they would just make the same effort for a one-day class on chemical problems, it could be very informative. Just like they teach you how to take care of drunks, they should teach you about the chemical hazards. But that's the problem right there. They're not going to pay you to go listen to what* they're *doing wrong.* □

Ben, repairman, chemical plant: *As far as having an adequate safety training program, what they have is a public relations program so that they can say to you and to anybody else that asks them that they have a safety program here. There's a once a month safety meeting that consists of them showing you a movie.* □

source of information related to inspections and consultation efforts. Workers can request an OSHA inspector's notes and data on monitoring measurements, apparent violations, and proper practices. Workers also may have access to consultative reports written in response to employer requests for help in identifying hazards. In a recent case in Wisconsin,[7] a local union filed a Freedom of Information claim for reports done in conjunction with their employer's appeal to delay correcting a hazard. Unless specifically excluded (as in South Carolina), those states with legislation guaranteeing access to public documents must allow workers to obtain copies of consultation reports.





Ted, welder, chemical plant: *The company will give us the information if it's required by law, but it's like handing a stone age man a rubber grip for his club. What the hell do I do with it, where does it go?*□

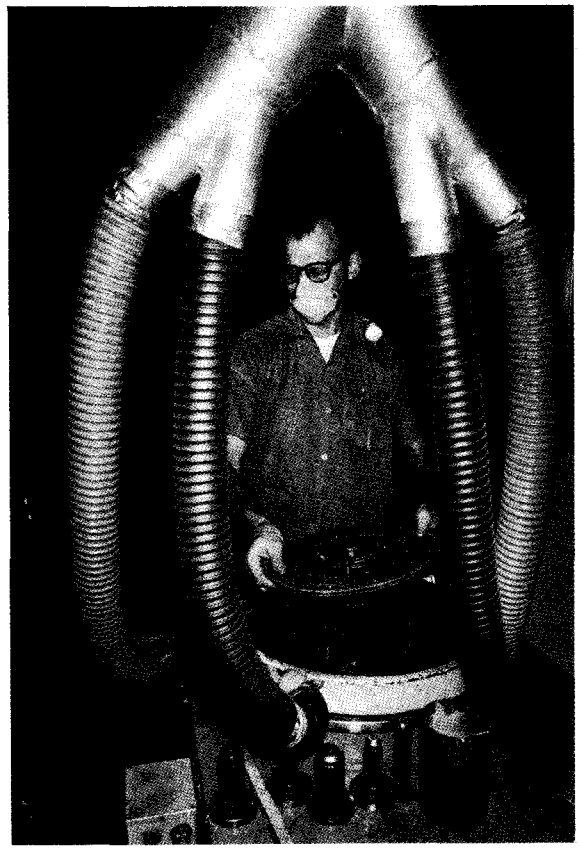
Joe, laboratory technician, chemical plant: *Somebody should take the data sheets that the manufacturers put out and explain them. The chemicals come into the plant with the original labels, mostly trade names. Unless you were a chemist or looked it up, you probably wouldn't know what it was. Most people don't know what the hell you're talking about with all these chemical terms. The bottom line is "Do Not Inhale the Vapors," so they will turn their head while they're sucking it in.*□

Sheila, laboratory technician, research institute: *The lab director sent around memos all the time saying, "The way to deal with chemicals is to use common sense." Well, read me these 38-letter chemicals and tell me how to use my common sense. They should train technicians regularly, not just for the first week on the job. They should train the scientist who is really into his research and doing it for years. There are a lot of changes in safety procedures, and a lot of update on chemicals. The lab supervisor should take people around and show them the specific hazards they're dealing with in the labs—which means they should train the supervisors. God knows my supervisor didn't know what the hazards were. I mean, he's a guy who says, "I like the way this stuff smells."*□

If the response to such efforts to obtain information inside the workplace is inadequate, there are a variety of external sources. Relatively few workers get information from television or newspapers; coverage of occupational health issues is thin and tends to emphasize government and corporate policy.[8] Rather, workers turn to government or to their union. OSHA, through its New Directions program, provided funding to unions, nonprofit organizations and educational institutions for a variety of efforts to inform workers.[9] Most national and international unions have permanent health and safety staff who provide training for local officers and safety representatives. Increased funding has allowed development of new programs coupled with more extensive training and resource materials. Some unions, such as the Oil, Chemical, and Atomic Workers Union, hired physicians to do hazard evaluations and provide technical assistance. In a unique effort, the International Brotherhood of Painters and Allied Trades developed a method of determining solvent concentrations before workers start a job.[10] With this method, a painter can use a step-by-step evaluation system to identify potentially hazardous conditions and rectify them before exposure.

Several nonprofit organizations conduct similar educational efforts. Among the most active are local Committees on Occupational Safety and Health (COSH) groups, composed of workers, health professionals, and others interested in promoting safe conditions. COSH groups run regional workshops and provide technical assistance and training for shop stewards and safety committees. Some tailor their programs to the needs of specific groups such as women workers, minorities, agricultural workers, and artists and craftspeople.[11]

Other resources include labor education programs run by land grant colleges, libraries, and government agencies. University-based health and safety classes may be offered as a part of a certificate program or on a one-time basis. They provide more in-depth material than that available in one- or two-day workshops. Workers sometimes turn to public and college libraries for refer-

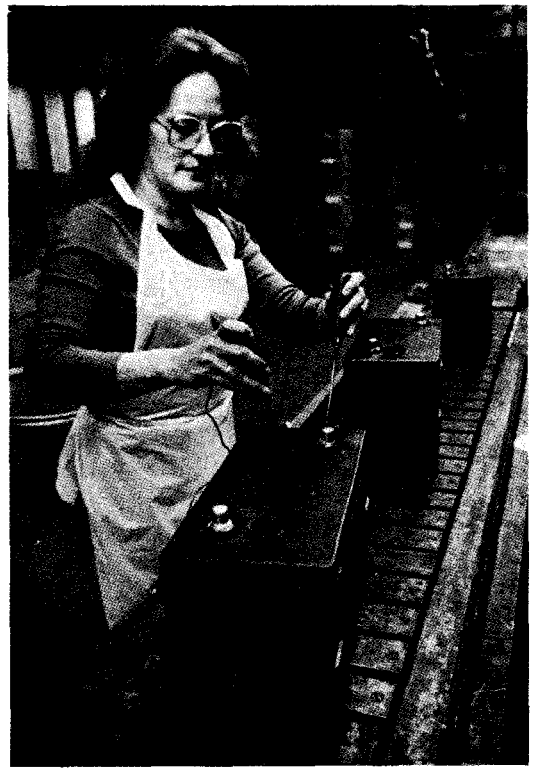


Bob, firefighter: *To my way of thinking, the state office building fire could have been settled pretty easily, if someone would have just come in, and told us a straight story about dioxin. But we were getting everything from "you're going to die" to "it's good for you, everybody should have a dose!" These were supposedly medical experts. Last spring a doctor at the local college who's supposed to be the foremost expert on PCB poisoning said that blood tests were useless because by the time we got them the dioxin was already lodged in the fatty tissue or in the organs of the body. Then a doctor from the Poison Center said that this "foremost expert" was not an MD so he wasn't qualified to tell us that. It was very confusing.* □

James, computer assembler, manufacturing plant: *They're always going around with meters to see if exposure levels are within specs but they always control the information. One area where I worked had a lot of dust. We knew it was bad because people were having trouble breathing. You had to blow your nose every half hour because your nasal passages would clog up. When I talked to my manager about it, he did bring someone to check it out. They brought a vacuum pump with a filter that would suck in the dust. But when it came time to tell us the results, they just said, "They're within company and OSHA specs." We could have fought for the information, but they would have stonewalled us. Then you go back to the fear of being labelled a troublemaker.* □

Stuart, mold maker, glass factory: *When a guy here got silicosis everybody was concerned, so we read a lot on it. What's silicosis? How do you get it? How did they find it? What's the doctor got to say about it? I don't want to depend on the company to supply the information I'm looking for. I want to know what is silicosis, what is aluminum exposure, what is lead poisoning? What's behind it, what can happen to you? I'm sure that the last thing the company wants is for me to find out.*

I just found out about the Right-to-Know Law a year and a half late. I talked to a few guys in the shop who knew absolutely nothing about it. It was never posted. I made a request for the standards on everything they've got in the shop. The safety director said he'd get them to me, but when will he get around to doing it? I'm not so sure they are required to provide in-depth information. I want to read more than just the minimum requirements. Companies don't want you to know, because they're afraid you won't come to work. □



Weak Federal "Right to Know" Standard May Preempt State Laws

Workers' "right to know" what chemicals they are working with took a big step both forwards and backwards recently when OSHA issued its final "Hazard Communication" Standard on November 25th, 1983. While federal "right to know" regulation is certainly a much-needed step in the right direction, OSHA's standard may well serve to weaken existing state "right to know" laws. Under pressure from local and state right-to-know laws, the Chemical Manufacturers pleaded with OSHA for a weak national law to pre-empt the local ordinances. And that is what they got.

The original national standard, issued in the last days of the Carter Administration, was promptly targeted for review by the Reagan Administration and revised into its final watered-down version. The Reagan Administration version limits the law to manufacturing facilities, exempting such workplaces as hospitals, dry cleaners and construction sites where serious chemical exposure problems exist. Although labeling is required in some workplaces for some chemicals, important sources of exposure such as piping systems are exempt to cut the costs of the regulation. The employer and manufacturer are responsible for determining if a chemical is hazardous using OSHA's narrowed criteria. If they can demonstrate that the chemical identity is a "trade secret" there are broad provisions to prevent disclosure to workers (though the identity will be available to physicians and other health professionals who will swear to secrecy). In addition, OSHA has given employers 2-3 years to comply with the new standard.

OSHA hopes the new standard will have a chilling effect on the passage of state and local right-to-know laws which are usually much tougher and also may allow community access. They also hope to pre-empt local ordinances by claiming the nonuniformity of laws interferes with interstate commerce, which is expressly forbidden by the OSHA law. States which have their own OSHA programs (like California) may have a stronger case in keeping their laws, while in states under federal jurisdiction (like Ohio) OSHA's rule may prevail. One irony of this situation is that the Reagan Administration has found itself fighting against the rights of states to govern their own affairs and for the Washington bureaucracy, in sharp contrast to its proclaimed "New Federalism" approach.

At this point, the state of the federal regulation is now up to the courts. The steelworkers, joined by the states of New York, New Jersey and Connecticut, have filed a lawsuit in the Third Circuit Court of Appeals against the regulation. State Attorneys-General are up in arms about the possible pre-emption. Meanwhile, some new *local* right-to-know laws are just now going into effect (e.g., Massachusetts', New Jersey's, and Illinois'). The pressure from the grassroots "right-to-know" movement is heading towards a national confrontation over *which* workers will know *what* about their workplace. □

—Scott Schneider

ence books on hazards, although they may be frustrated unless someone is available to explain the technical material. State agencies along with OSHA and NIOSH can provide information on health hazards, workers' rights, and techniques to reduce exposure. In addition, OSHA can provide (usually after a FOIA request) historical data on an employer including past citations, inspection worksheets, sampling data and progress reports. NIOSH will conduct a Health Hazard Evaluation upon the request of three employees or a local union. The Agency will come to the workplace and attempt to identify the cause of any work-related illnesses.

Barriers to Information

Despite these resources, workers confront many difficulties in getting information. First, they find themselves in situations of technical uncertainty about risk. While industrial and government laboratories have tested the toxicity of many substances, they have focused attention on acute exposures and acute effects because of the urgency of these problems. Less common are investigations of chronic exposures because they are time consuming and costly. Long-term studies are increasing, but the limited state of knowledge leaves much room for conflicting interpretations about the health effects of exposure to many substances.

Second, they find access to existing information constrained. Fearing that health and safety information would cause unwarranted anxiety and encourage refusal to work, or that disclosure of the generic identity of substances or even detailed health information could jeopardize trade secrets, corporate managers have often been reluctant to disseminate information to employees. Those firms which systematically provided information about hazards to employees tend to do so in abbreviated form. Relatively few workers know how to obtain information from sources outside their place of work.

The interviews presented with this article show how the workers themselves express the problems of obtaining information about chemical hazards involved in their work. They characterize their situation as frustrating as they try to cope with inadequate training, technical complexity, conflicting expertise, and management control.

The Use of Information

Although information is crucial to any attempt to improve conditions, it is not empowering in and of itself. In fact, well-informed workers who have no power to control the risks they understand, experience debilitating anxieties and fears.

Yet, information can make a difference. In nonunion shops, it can be an organizing tool providing common experience. Although health and safety is rarely the sole organizing issue, it complements traditional issues of wages and arbitrary authority. Even if collective action is difficult, individuals can still use protective gear such as respirators and gloves, file a complaint with OSHA or, if they become ill, seek compensation.

Unionized workers are in a better position to challenge managerial authority. Health and safety committees may have inspection rights and the power to make changes in production. Unions can ask OSHA to inspect hazardous conditions without exposing individual workers to harassment. Negotiated grievance procedures provide mechanisms for resolving disputes. Strong unions can negotiate contract language giving workers the right to refuse unsafe jobs; collectively they may have the right to strike over health and safety. Some have engaged in wildcat strikes when conditions warrant extreme action. There are a wide range of strategies for change which can be pursued, all based on being knowledgeable about hazards.

These possibilities suggest the stakes involved in controlling information. As Nolan Hancock, Legislative-Citizenship Director for OCAW, put it, "An informed worker takes action. A worker who is kept in the dark is complacent."[12] □

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2. The major survey or worker attitudes is R.P. Quinn and G.L. Staines, *The 1977 Quality of Employment Survey,* Ann Arbor; Institute for Social Research, 1979.

3. Agreement between Republic Steel Corp. and USWA (production and maintenance), August 1, 1980 to August 1, 1983.

4. 29 CFR 1910.20. The standard governs employee access to medical, exposure and testing records in the possession of an employer. Employees have the right to see their records and the records of similarly situated employees and to have copies. Employees may designate a representative, including their union, to act in their behalf.

5. Right-to-Know legislation has been enacted in California, Connecticut, Maine, Michigan, New Jersey, New York, West Virginia, Wisconsin, and in Cincinnati, Ohio, Santa Monica, California, Danbury, Connecticut and several other cities. See box on page 21 of this issue, and 48 Federal Register 53280, Nov. 25, 1983.

6. This information is derived from the authors' interviews of employees.

7. Bureau of National Affairs, "Potential Problems for Consultation Seen in Data Release Under Wisconsin Law," *Occupational Safety and Health Reporter,* August 11, 1983, pp. 229-230.

8. An interesting discussion of press coverage of workplace health issues is Chris Raymond, *Uncovering Ideology: Occupational Health in the Mainstream and Alternative Press, 1970-82,* unpublished dissertation, Department of Sociobiology, Cornell University, May 1983.

9. Thorne Auchter, Assistant Secretary for OSHA, reduced New Directions funding by two-thirds in his first year of office. Significantly bigger cuts came out of worker-oriented grantees (educational institutions and nonprofit organizatons such as COSH groups) than employer groups.

10. M. Larson, R. Wolford, and T. Crancer, "Evaluation of Six Computerized Mathematical Models for Calculating Exposure Levels of Airborne Concentrations of Solvents During Spray Painting." Presented to the American Industrial Hygiene Assoc. Conference, Cincinnati, OH June 9, 1982.

11. A useful guide to the variety of programs available to workers is David Lerman, "Occupational Safety and Health Resource Guide," *L abor Studies Journal 6(1):*152-160.

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TEACHING PEACE:

SftPer's Review Five Curricula on the Arms Race

by Barbara Beckwith and Connie Phillips

Education is not neutral, despite claims to the contrary. Teachers are, like anybody else, individuals with deeply felt values, varied political beliefs, and particular social-economic backgrounds. Our teaching does reflect particular points of view, overt or implied.

Neither are the texts available to us neutral. They are, rather, interpretations of events based on accepted social-political norms, although couched in "objective" prose.

The Council on Interracial Books for children recently studied a group of the most widely-used secondary history texts. They concluded that nuclear war issues are sidestepped; that texts either avoid references to the arms race or acknowledge its existence but fail to provide background information necessary for an informed discussion. The researchers called for textbook publishers to start including substantive information on four core topics: the grave consequences of war in a nuclear age, the power of the military-industrial complex, the expenditures allocated to armaments compared to social services, and the criticism by peace activists of war as a legitimate tool for resolving conflict.

Some teachers have begun to give their students that missing information. Educators have spent time individually or in groups around the country educating themselves so they can educate their students. We are among those teachers, having contributed to three or four newly-developed curricula produced by Educators for Social Responsibility, Jobs With Peace, and the National Education Association in collaboration with the Union of Concerned Scientists and the Massachusetts Teachers Association.

Ironically, instead of being praised for promoting democratic debate on a crucial issue affecting young people's lives, we have been charged by some with indoctrination and anti-Americanism. Phyllis Shlafley and American Federation of Teachers President Albert Shankar led the attack on *Choices*, the NEA curriculum, followed by President Ronald Reagan. "You stand in bright contrast," he told AFT members, "to those [of the NEA] who have promoted curriculum guides that seem to be more aimed at frightening and brainwashing American schoolchildren than at fostering learning and stimulating balanced, intelligent debate." Reagan made clear his desire to keep nuclear arms issues out of the classroom, out of the public's eye, and in the hands of his administration.

Also ironic was the conservative journal *Human Events*' criticism of *Choices* for causing students to "move away from passive acceptance toward activism and self-reliance." The editors cited evidence that the curriculum made students impatient to vote, stimulated them to read more newspapers, and drove them to insist on calling the Pentagon to verify information on the current stock of nuclear weapons. The magazine called the NEA "a left-wing labor union trying to remake America in its image. The immediate target is America's children." Active participation by youth in public issues is apparently **not** *Human Events'* view of how democracy in America should work.

Some teachers hesitate to bring up the subject of nuclear arms in the classroom because of such attacks by conservative groups. In addition, the topic creates honest dilemmas for most teachers, who worry that it will be too frightening, too complicated, or too charged with bias to handle. Many ask, as we did, whether it is

Barbara Beckwith is a freelance writer, former teacher, and a member of SftP.

Connie Phillips is a longtime SftP *member, currently serving as* SftP*'s Fundraising Coordinator. She is also coeditor of* Feed, Need, Greed, SftP*'s high school curriculum on food, resources, and population.*

fair to expose young people to a subject that might bring up fears of death or of possible global annihilation. Since most of us are in the habit of encouraging, reassuring and empowering students, it *is* hard to discuss a subject fraught with real dangers with our students.

However, child psychologists such as William Beardslee and John Mack have done studies which show that children at even very young ages think about nuclear war. The psychologists assert that addressing the subject in the classroom gives young people a small sense of relief they are not alone in their thoughts. Students who fully explore the subject feel reassured and more confident they can affect the government's decision-making. In other words, children know what's going on. We know they know. The safest way to deal with their awareness is to work to change their sense of powerlessness. We are now convinced that information and action are the best antidotes to fear; the other choice is despair.

We also struggled with our awareness that we are not military or foreign policy experts. We wondered if we have enough information to present such a complex subject, which is ordinarily the exclusive province of governmental think tanks, presidents and top secret files. We decided that we do. Nuclear arms is not a subject too complex or inaccessible to ourselves or to our students. We have a responsibility to find out; we have a right to know.

Finally, we wondered if our personal political convictions might skew what we wrote. We made sure the first drafts of our curricula were piloted in classrooms and that the final draft reflected feedback from teachers who did that piloting. For example, *Choices* was tested by 47 teachers in 35 states. *Decisionmaking* (Educators for Social Responsibility) and *Dialogue* (Jobs With

Case Study: The Making of a Slide Show on the Effects of Nuclear War

"The Biology of Nuclear War" is a slide-tape show for high school classes and general audiences that had its origins in a study group formed in the fall of 1979. At that time, a fresh nuclear arms build-up was beginning which included the MX, and the Pershing II and cruise missiles for Europe. Ratification of the SALT II nuclear arms limitation treaty apparently depended on acceleration of weapons spending, and some public figures even felt free to talk about winning a nuclear war. Several graduate students and postdoctoral fellows at the Harvard Biological Laboratories, including myself, started to discuss these issues regularly. From what we read, it struck us that American escalations of nuclear weaponry were largely unilateral, based on false reports of missile and bomber "gaps." It was clear that the public was being misled on a very grand scale.

The idea to produce a slide show developed following the first Physicians for Social Responsibility Conference on the "Medical Consequences of Nuclear War" held at Harvard University in February, 1980. The meeting demonstrated the wealth of scientific information available on the subject of nuclear war effects. We decided to stress underlying scientific concepts so that the show would fit into a high school biology class.

Production of the show was a 2½ year education. Although there are several good books on the subject of nuclear war effects available today, most we looked to then were 15 or more years old and out of print. We did not start in earnest until one group member brought in detailed notes from a radiation biology text. Inertia and even fear of the subject were important obstacles to starting our work.

At the November, 1980 meeting of the National Biological Teachers' Association in Boston (which we learned about through Science for the People) we presented an early version of the show, calling ourselves The Biology of Nuclear War Study Group of Harvard University. We made contact there with the Carolina Biological Supply Co., the largest commercial source of high school science materials in the U.S., which eventually produced and now markets the show. Other educational distributors at the meeting seemed to feel the idea of the show was too controversial, might be taken as un-American, etc., and were not interested. By contrast, Carolina was quite receptive.

In its final form, the show covers many aspects of nuclear war effects—atomic, cellular, social, and ecological, referring often to the atomic bombing of Japan. It is most careful in describing the creation of radioactive fallout and its effects on the human body. A teacher's guide was also prepared with extensive notes.

The most difficult practical task was to find worthwhile and vivid slides, and to obtain permission to use them. We were fortunate that an artist joined our group and prepared some excellent graphic material. In fact, had our group not broadened beyond basic research scientists, the project would have been difficult to complete because of our lack of experience. The needs of a slideshow are very basic: great clarity, extensive editing to remove interesting but only slightly relevant material, and most importantly, close co-ordination between slides and text. Extensive outside criticism by teachers and others was essential to make us see the truth of this.

There were several notable aspects of this project. The group organized and found new members easily, attracting individuals deeply concerned about the issues, but having no outlet to express their concern. It fulfilled a need for extensive discussion of government propaganda, the nuclear arms race and similar topics, often consuming more meeting time than work on the slideshow.

We consciously agreed to produce the show via an established channel, i.e. Carolina Biological, for the sake of professional quality and good accessibility to high school teachers, who have reacted positively so far. But its price (about $100) will make it harder to reach peace groups, for whom many cheaper productions are available.

—— Scott Thacher

Peace) were also classroom-tested. *Perspectives* (Educators for Social Responsibility's second curriculum) was presented as a "work in progress" to be revised upon teacher feedback. *Crossroads* was not pretested only because of time restraints.

Conservatives may consider these curricula biased simply because they ask students to examine instead of blindly accept, America's present policy of nuclear arms build-up and deterrance diplomacy. Merely bringing the subject up may be seen as anti-government propaganda. But we consider full debate the opposite of bias. It is conventional textbooks' non-examination of military-industrial power, interventionism and capitalism which is bias, a dangerously hidden bias.

After a careful re-reading of the four curricula, we find all informative, imaginative, skill-building and thought-provoking. What they do, they do well. But there are gaps. We realize upon reflection that certain crucial topics are not fully dealt with. The curricula bring out the economic *Effects* of the military build-up, but don't examine the military *Causes* of that build-up. Neither do they explain the military-industrial complex, first named by a "respectable" president, Dwight Eisenhower. Also, the curricula rarely makes connections between militarism, imperialism, racism and capitalism. A teacher could use these curricula without facing significant issues.

Finally, none of the curricula has adequate information on the USSR, although the Educators for Social Responsibility books take a step in the right direction. Although the "nature of the Soviet Union" is hotly debated in the media, none of the curricula gives students solid information on the USSR's power structure, foreign policy or internal economic pressures. All four books would be stronger with such missing issues included. But each does have a vast amount of stimulating information and activities which teachers can use to start the dialogue.

A team of eight teachers wrote these three books as separate English, Science and Social Studies units. Each is highly structured in a clear, simple format which includes objectives, materials, teacher directions, easily-reproduceable student worksheets, and homework assignments.

The three books examine the effects of the arms race from different perspectives. The Science unit looks at the physical, biological and ecological effects of a nuclear explosion and raises questions about national security, the concept of limited nuclear war, nuclear proliferation, and civil defense. The English unit also describes the effects of a nuclear bomb from a physical, psychological and economic standpoint, and in the process builds word skills, essay-writing and discussion skills. The Social Studies unit targets the economic effects of the military build-up on students' lives, using bar graphs, world maps, and employment statistics.

Crossroads: Quality of Life in a Nuclear World

1983. 3 books. $4 each or $10 for the set of three.

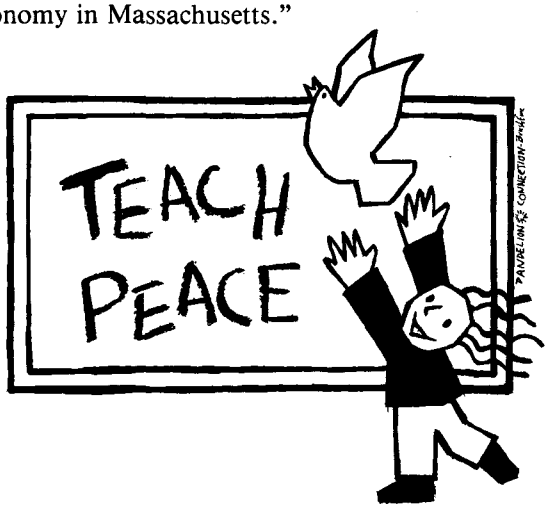
Order from: Jobs With Peace, 77 Summer St., Room 1111, Boston MA 02110

Age level: high school

The economic approach is *Crossroads*'s definite strength. Its information sheets, worksheets, games and role plays stimulate responsible thinking and discussion. Each of the units ends with a look at the options available for dealing with the issues, and gives suggestions for personal action, whatever a person's veiwpoint is.

Crossroads also has its weaknesses. Some teachers might feel uncomfortable with budgets and policies clearly labelled as Reagan Administration policies, or with the "Duck, Duck, Cover" exercise on civil defense which makes light of plans the federal government takes seriously. One of the stories, "Late for School" is macho in tone.

Jobs With Peace also distributes two pamphlets which could be helpful companions to the curriculum: "How to Organize in Your School Community" and "The Effects of Military Spending on Education and the Economy in Massachusetts."



Keith McHenry/Brushfire Graphics

Decisionmaking in a Nuclear Age

1983. $12.50. 375 pages.

by Facing History and Ourselves project (who also authored a curriculum on the Holocaust)

Order from: Educators for Social Responsibility, 23 Garden St., Cambridge MA 02138

Age level: high school

Much of the material in *Decisionmaking* has been piloted for two years in high school classrooms. The present edition includes changes based on that feedback. The 136 activities in this book deal not only with nuclear topics, but also with deeper issues such as aggression, patriotism, capital punishment, chemical and biological weapons, the Cold War, gun control and space weapons. There are in-depth sections on the Hiss and Rosenberg Trials and the social responsibility of scientists. Role plays put students in the place of advisors and decision-makers at three points in time: when the decision was made to drop the A-bomb, the Yalta Conference after World War II, and the Salt 2 negotiations. Students are given a clear and comprehensive background orientation which forces them to look at those situations in their full complexity.

The curriculum is assiduously neutral, asking hard questions of all positions without taking a stand of its own. At the end of each unit, student quotes and journal entries show teachers the range of reactions students have had to the unit, followed by a discussion of how those reactions can be handled. The book ends with a positive unit on "Making a Difference," with inspiring accounts of students who fought to save a local forest and two women scientists who kept the American version of thalidomide off the market.

One of *Decisionmaking*'s strengths is also its weakness. It contains such a wealth of material that it is difficult to sift through it all and select what is usable. Student worksheets are not easily reproduceable, since comments to the teacher are on the same page. Also, some of the readings may be difficult for less-skilled students.

Dialogue: A Teaching Guide to Nuclear Issues

1982. $12.95. 269 pages.

Order from: Educators for Social Responsibility. 23 Garden St., Cambridge MA 02138

Age level: K to 12

Dialogue is both a sourcebook for teachers and a set of exercises to use with students. It has separate sections for grades K-3, 4-6 and 7-12. There are 36 exercises for grades 7-12 alone. Many focus on learning to listen, negotiate, recognize bias in language and statistics, and interpretation. The rest deal with nuclear facts, history and issues.

The focus on developmental issues is unique to *Dialogue*. Each age-group section starts with a sensitive discussion of what particular needs and issues that age group has and how they might shape the teacher's approach. The book also gives the psychological rationale for teaching about nuclear issues, and shows teachers how to organize support among other teachers, parents, administration and media.

Dialogue is carefully non-sexist. The style varies, since 69 people contributed to the writing of it. Student worksheets are not arranged on separate, easily-reproduced pages. *Dialogue* also gives less attention than *Choices* or *Crossroads* to economic causes and effects of the nuclear arms race; it deals with the subject more as an ideological and technical problem. The wide range of background provided, and the loose structure of the chapters, make this a text attractive to teachers who prefer to create their own teaching units.

Perspectives: A Teaching Guide to Concepts of Peace

1983. $12.95. 402 pages.
Order from: Educators for Social Responsibility, 23 Garden St., Cambridge MA 02138
Age level: K to 12

Perspectives addresses broader issues than ESR's first curriculum, *Dialogue*. Teachers who used *Dialogue* said their students had concrete concepts of war, but weak ideas of peace, which they saw as passive and boring. Students also had stereotyped the Soviets as "the Enemy" and felt cynical about their future and powerless to change it.

Perspectives reconceptualizes peace as active, dynamic, and tied to the presence of social justice. It looks at prejudice, propaganda, ethnocentrism, and ideology. It explores theories of aggression, the role of the media, and third-world issues, bringing up such recent events as the KAL airliner downing and euromissile deployment. It is one of few curricula to question the promotion of peace through violence. It gives students role models by describing a broad spectrum of peacemakers, including social activists, visionaries, negotiators and conventional peacekeepers like the police. It ends with "Imagining the Future," a series of activities to encourage students to think globally, and act locally.

Like *Dialogue, Perspectives* is a compendium of the ideas and writing of dozens of contributors. The result is a rich sourcebook of material, ideal for teachers who like to pick and choose what they teach, but perhaps annoying to those who want units to be pre-structured. It also could use more emphasis on the USSR and economics.

Choices: A Unit on Conflict and Nuclear War

1983. $9.95. 144 pages.
Order from: Union of Concerned Scientists, 26 Church St., Cambridge MA 02138
Age level: junior high school

Choices is a joint project of the Union of Concerned Scientists, the National Education Association, and the Massachusetts Teachers Association. It was pilot-tested by 47 teachers in 34 states and revised on the basis of feedback.

Like *Crossroads, Choices* is written as a tightly-structured series of lessons, ready for immediate use by the teacher. Each is outlined in capsule form for the teachers, including purposes, materials and step-by-step instructions. The student worksheets are easily reproduceable, and the curriculum is the only one of the four to include two factual quizzes for the teacher to give students. Role plays, cooperative games, mapping exercises and journal-writing exercises are included, plus background information from USC and a forward by Harvard University Professor John Mack on the psychological rationale for teaching such issues to children. Separate teacher and student glossaries are provided.

One teacher said *Choices* was useful to students on a personal as well as an educational level, because it helped students resolve peer conflicts with "strategies short of punching each other out," and empowered them by teaching them the terminology of the arms race and disarmament proposals.

Although *Choices* attempts to be "fair" by presenting different sides of the disarmament and peace-through-strength issue, a reader can discern that the authors advocate de-escalation of the arms race rather than escalation. The Eisenhower quote in the last exercise of the book is such a subtle indication: "People want peace so much that governments had better get out of their way and let them have it."

Continued from p. 9

that manage nuclear projects in many countries usually sign "cost-plus" contracts with the utilities. (Fluid plant design and component costs make it virtually impossible to set a firm price and hold the builder to it.) Under the cost-plus system, the lead company and its subcontractors have little incentive to minimize costs. In fact, incentives are strong to stretch out construction and raise the total bill since profits are usually calculated as a fixed percentage of the project's cost. Utilities in turn pass all costs along to their customers, regulators permitting. Even those utilities that do rigorously attempt to control costs often lack the staff to effectively oversee the project. This system has made nuclear power highly profitable for many of the engineering firms that build nuclear plants, though not for the major vendors.[27]

The nuclear industry argues strenuously that inept regulation is at the root of the cost increases that plague it in most countries. The growth of regulation has indeed had an impact on cost. Some ad hoc requirements have added little to plant safety, and regulators have reversed themselves frequently. But blaming nuclear cost overruns on regulation alone is like killing the messenger who carries bad news.

Regulatory standards are essential for correcting inadequate technologies that frequently break down and industries that are often paragons of inefficiency. As former Nuclear Regulatory Commissioner Peter Bradford has said, most of the industry's problems "lie in an omniverous dream of growth that swept aside sensible regulation, sensible planning and sensible government attention to the side effects." Evidence grows of fundamental problems in many aspects of current plant design that will need further upgrading in order to prevent accidents. S. David Freeman said, "We ought to realize that with nuclear power, we are still experimenting ... We stopped the research and development effort much too soon." Reduced regulation without fundamental changes in nuclear technology and management could make nuclear plants less safe, but not neccessarily less expensive.[28]

Disposal and Decommissioning

Important uncounted costs may further tip the economic scales against nuclear power. Disposal of nuclear waste and decommissioning old nuclear plants are important factors in the overall equation, and yet neither

WPPSS: Whoops, The Largest Default in History

Nuclear power's worst financial disaster so far, as some SftP readers may know, is that of the Washington Public Power Supply System (WPPSS). Formed in the late 1950s as a joint agency, WPPSS pooled the resources of over 100 public utilities in the Pacific Northwest. In the early 1970s, facing escalating power demand, WPPSS launched one of the largest nuclear construction projects ever. Five nuclear plants were begun, each of at least 1000-megawatts generating capacity, all to be financed by tax-exempt municipal bonds issued by the Supply System.

Projected costs for the badly-mismanaged projects ballooned from $4 billion in 1974 to $24 billion in 1981. Most of the money for the plants was borrowed, and by 1980 the Supply System was issuing $200 million in bonds every 90 days. The total outstanding debt passed $8 billion. While costs escalated, electricity demand growth slowed, quashing the notion that the five plants were essential after all. By 1981, the financial condition of the Supply System had deteriorated badly and its directors canceled plants 4 and 5, on which more than $2 billion had already been spent. The Washington State Supreme Court ruled in June 1983 that contracts requiring municipal utilities to honor the bonds for the canceled plants were not legally binding, causing the Supply System to default on the bonds—the largest such default in U.S. history.[1]

Even without the court ruling, default was inevitable. WPPSS had already been forced to mothball two plants that were 63 percent and 75 percent complete. (The one plant still under construction is 98 percent complete and scheduled to begin generating power in 1984.) Among the casualties of the collapse are several thousand laid-off workers, the financial health of many energy-intensive farms and industries, and the municipal bond market itself. It is a crisis of epic proportions that could tie up the banks and the courts for years to come. Yet as striking as the scale of the default itself is the failure of the public utilities to respond earlier. Evidence mounted throughout the 1970s that costs were soaring. As early as 1977, studies showed that cost-effective conservation measures could eliminate the need for two of the plants. But the utilities instead heeded the warnings of the federal Bonneville Power Administration that massive blackouts could occur without the five nuclear plants. Wall Street gave the bonds strong credit ratings and marketed them aggressively. The result was a circle of reinforcing misconceptions. A chagrined analyst at T. Rowe Price Associates Inc. said, "There has been an awful lot of blind faith in contract terms in the market generally and insufficient attention paid to the economic viability of the projects and the financial condition of issuers."[2] Speaking of his fellow directors, WPPSS Chairman Carl Halvorson said simply, "They became captives of the mystique of the nuke. And they had unlimited money. That was the worst of it."

has been resolved or even adequately researched in any country. Nuclear wastes continue to pile up in temporary storage, and most nuclear plant operators do not have procedures for permanently shutting down plants after their presumed 30-year life span is over. How much these two problems will eventually add to the cost of nuclear power is highly uncertain.

Options for long-term disposal include dumping wastes in Antarctica or launching them into space, but for safety and health reasons, attention has focused on burial in so-called stable geological formations. West Germany leads in developing such disposal sites—in natural salt deposits—but most countries are still only investigating the possibilities. High-level wastes must be prevented from leaking into ground water, and from there to the larger biosphere. Many geologists doubt that long-term guarantees will ever be possible. The United States, which has the most high-level radioactive wastes, did not enact a waste disposal law until 1982. The law requires the Department of Energy (DOE) to develop a working plan for waste disposal by 1990. DOE is apparently already behind schedule, and major technical uncertainties and political battles are sure to frustrate efforts to meet the Congressionally mandated target.[29]

The decommissioning of old nuclear power plants presents similar, but perhaps less well-known economic worries. The term "decommissioning" is a misnomer since it implies a routine shutdown procedure similar to abandoning an old coal mine. But nuclear plants that have been operating for decades have many parts that are highly radioactive and must be kept from the biosphere for centuries. One approach is called "entombment"—sealing a plant with reinforced concrete and providing guards for an indefinite period. But entombment, though possibly economical, poses unacceptable long-term environmental problems, particularly since some materials would remain highly radioactive for as long as 100,000 years, long past the useful life of concrete. Insuring the integrity of human institutions to provide centuries of guard duty is also highly problematic. Nuclear industry officials cringe at the notion of hundreds of nuclear "tombs" around the world serving as a reminder of the long-term hazards of nuclear power.[30]

The more likely approach to decommissioning is dismantling each nuclear plant piece by piece, and transporting radioactive materials to suitable waste sites. The technical difficulties involved are considerable. Because of the high levels of radiation that would be encountered, elaborate safeguards must be used to limit human exposure. Some parts of the reactor would have to be dismantled underwater in special pools using remote control torches. Other procedures would have to be done in many shifts to limit the radiation received by individual workers.

Cost estimates for dismantling a 1000-megawatt nuclear plant range from $50 million to over $1 billion (1982 dollars). The largest plant yet dismantled was the tiny 22-megawatt Elk River plant in Minnesota. The procedure required two years and $6 million, but provided few lessons for dismantling plants 50 times as large and much more radioactive. Yet the low costs frequently cited by the nuclear industry are based on extrapolation of the Elk River experience. More revealing is the Shippingport plant, scheduled for decommissioning in the mid-1980s at a cost of $60 million to $70 million, according to a contract signed in late 1983. A sign of the difficulties involved is the ongoing cleanup of the disabled Three Mile Island plant which has encountered a wide range of unanticipated problems and will cost well over $1 billion.[31]

Utilities in most countries are required to earmark funds for decommissioning nuclear plants. West German planners set aside decommissioning funds equal to 17 percent of the cost of building a plant. In the United States, the benchmark figure reguired in most states is 10 percent, matching estimates made in government studies. (Some researchers believe that the final cost could be as high as 100% of construction costs.) This money, however, is generally a "shadow account," since it is not separated form the rest of a utility's assets. Only six U.S. states in 1983 require that the funds be held in separate reserve accounts. In the United States, 51 nuclear plants are scheduled for decommissioning in the decade form 2003 to 2012, which could be a major burden for utilities even if the lower cost estimates prove accurate.[32]

In no other industries are shutdown costs a significant fraction of initial capital costs. Yet nuclear power development has continued without a full assessment of decommissioning costs or efforts to secure sufficient funds, another sign of nuclear power's protection from market forces. A joint government-utility effort to dismantle a large nuclear plant is needed so that a price tag can be placed on decommissioning and reasonable set-aside requirements be implemented. Utilities would be wise to consider these figures when deciding whether to build a nuclear plant. Leaving these questions unanswered is not only dangerous to society but violates fundamental business principles. No clearheaded capitalist would proceed with nuclear development as long as waste disposal and decommissioning remain unresolved.

Financial Meltdown in the United States

In light of all this trouble in the nuclear industry, Wall Street has signaled utilities to trim nuclear power programs. Leonard Hyman of the Merrill Lynch Com-

pany said in 1981 that, "The market requires and is getting a moderately higher rate of return from investments in utilities that are constructing nuclear power plants." On average utilities with nuclear construction programs have lower stock prices and bond ratings than utilities that do not.[33] Many financial advisors now warn investors to avoid utilities with nuclear projects. The Three Mile Island accident and its billion-dollar-plus bill for cleanup costs alone has forced the investment community to rethink the financial risk equation. Many believe that the utility industry as a whole is badly underinsured for such an accident. Robert Barrett, a vice president at Paine, Webber, Jackson & Curtis, calls nuclear power "a potential time bomb that could push a company to the brink of bankruptcy overnight."[34]

One utility of particular concern is the Long Island Lighting Company (Lilco), builder of the 820-megawatt Shoreham nuclear plant in New York. Ordered in 1967, the plant is now scheduled to be complete in 1984 at a cost of $3.4 to $3.6 billion, about 15 times the original budget. The Shoreham plant will generate at most one-third of the utility's electricity, but its cost exceeds the book value of Lilco's entire electricity system. With the prospect of having to raise electricity rates by at least 60 percent, the utility commission is looking for ways to refinance the debt and phase in rate increases. Lilco may even try to sell the plant to the state, which would pay for its by issuing tax exempt bonds—thereby forcing federal taxpayers to bear some of the burden. If the Shoreham plant is permitted to operate, which many observers now doubt, it will yield the most expensive electricity ever produced by a large central generating station.[35]

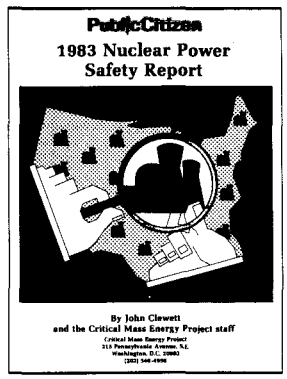
Lack of attention to economic viability and abdication of responsibility by decision makers explains many of the problems plaguing nuclear power. Further clouding the nuclear "market" are major government subsidies. Recent studies put total U.S. government spending for nuclear power development in the last three decades at between $12 billion and $40 billion, depending on the accounting methods used. Two-thirds of the total, or as

Nuclear Power's U.S. Safety Record: Over 12 "Mishaps" Per Day

The fact that Wall St. has come around to realizing that nuclear power in this country does not make good economic sense may well spell disaster for the nuclear power industry. But, as we have reported for years, there are many more problems with nuclear power than the fact that it costs a lot. (See, for example, SftP Vol. 12 No. 4, Vol. 11 No. 4, Vol. 10 No. 5.) One of these problems is the industry's abysmal safety record over the years. While presidential candidate John Glenn may state that "Nuclear power is an extremely safe power source,"[1] the facts are otherwise.

The Critical Mass Energy Project (CMEP) has just recently published its fourth annual *Nuclear Power Safety Report,* and its excellently-documented facts and figures bring the picture home forcefully. Among the findings for the 1982 calendar year:

- 4,500 "mishaps" reported at U.S. nuclear power plants in 1982, up 10% from the 1981 total. This means approximately 12 "mishaps" per day across the country.
- Ten nuclear power plants had more than 100 mishaps each.
- Nineteen nuclear plants had five or more mishaps deemed "particularly significant" by CMEP.
- Nearly 50% of these mishaps were due to equipment problems or failures.
- More workers than ever before, 84,332, were



exposed to measurable amounts of radiation, a figure which has increased 113-fold since 1969.

- One out of every three nuclear plant workers with measurable radiation doses received more than 500 millirems (.5 rems), three times higher than the recommended maximum exposure to the general public (170 millirems).

Also among CMEP's information are detailed descriptions of the major mishaps of the year, tallies of the plants with the most mishaps, with the most workers exposed to radiation, and the worst-managed plants overall. See the Resources section (p. 34) for information on how to order a copy. □

1. *Environmental Action,* December 1983/January 1984, p. 17.

much as $24 billion, is for reactor research and development. Other big-ticket items include subsidies for enriched uranium, nuclear waste disposal R&D, and subsidized sales abroad through low-interest loans of the Export-Import Bank. If utilities directly paid these costs, including breeder reactor development, it is estimated that nuclear electricity would be 50 percent more expensive.[36]

Not inlcuded in these figures are gaping tax loopholes for utilities that probably exceed all other subsidies combined. Investment tax credits and accelerated depreciation of assets allow utility companies to pay little taxes. Because the utility business is the most capital-intensive industry in the world and because nuclear power is the most capital intensive part of that business, such tax breaks are an enormous subsidy for nuclear investment. Although these incentives cannot be quantified precisely, Cornell University economist Duane Chapman concluded in 1980 that almost a third of the cost of nuclear plants is paid for by federal tax subsidies, compared to one-sixth for fossil-fuel-fired power plants.[37] The U.S. utility industry as a whole has an effective tax rate of only 9 to 11% after using available loopholes, according to a study by the Environmental Action Foundation.[38]

addition to the $10 billion worth of plants canceled since the mid-1970s, DOE projects that between $4.5 and $8.1 billion of additional plants will be canceled in coming years. (The actual total will likely be higher still.) Regulatory battles are frequently fought over whether ratepayers or stockholders should pay these costs. Recent studies, howver, show that approximately 40% is paid for by taxpayers in the form of tax deductions when utilities write off the lost investment on their tax returns—a $4 billion dollar write-off in the past decade.[39]

Also crucial to the U.S. nuclear industry is the Price-Anderson Act, passed by Congress in 1957. It established a $560 million limit on the liability of a nuclear plant's builder and operator for any damage the plant might cause. Experts agree that a serious nuclear accident could result in damage mounting to tens of billions of dollars—for which private insurance cannot be purchased. (Every insurance company has a nuclear exclusion clause in its contracts.) When the Price-Anderson Act became law, the perceived risks of nuclear power were so geat that the industry would not proceed without an exemption from the liability laws that govern all other industries. But members of Congress and the staff of the Nuclear Regulatory Commission have recently proposed abolishing the Price-Anderson Act. They view it as inappropriate for an industry now 20 years old and as a disincentive for reliable operation of nuclear plants. What terminating the Price-Anderson Act would do to the nuclear industry is unclear, but it would certainly bring nuclear power closer to the real economic world.[40]

The U.S. Atomic Industrial Forum began a 1982 press release with the assertion that, "The U.S. nuclear power program enters the home stretch of 1982 like a runner poised in mid-stride."[41] But the positive indicators the industry points to are the number of plants entering service and the power they generate—each of which continues to lag earlier projections by wide margins. No longer is the industry offering predictions of when it might stop living off pre-1975 plants and ordering new ones. Perhaps the most bullish recent forecast is DOE's 1982 "mid-case" projection for the year 2000, which assumes that another 25 nuclear plants will be ordered in the eighties.[42] This projection is probably little more than fantasy. Serious analysts who expect to see additional nuclear orders before 1990 are hard to find.

The list of industry "preconditions" for the revival of nuclear power is usually dominated by regulatory reform, higher electricity rates to pay for the plants while they are being built, and lower inflation and interest rates. These issues, however, hardly scratch the surface of the industry's problems. The fundamental changes that would really be needed—a guaranteed reduction in nuclear construction costs and a major surge in electricity growth—are far less likely.

With nuclear power much more expensive than available alternatives, even under the most favorable assumptions, and with the enormous financial risks a utility must now take to invest in nuclear power, additional orders in this decade are inconceivable. To encourage new orders, nuclear power development would have to restructured—in other words, further removed from market discipline. Government would have to bear more of the burden. Bertram Wolfe, a vice president in charge of the nuclear division of the General Electric Company, represents a growing mood in the nuclear industry, when he says, "I just don't think you're going to see a revival of nuclear power until there's much stronger government invovlement in the business."[43] The nuclear capitalists are now in full retreat. □

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15. Figure based on a nuclear generating cost of 11¢ per kilowatt-hour that, with transmission and distribution costs and line losses, comes to a delivered price of 14.3¢ per kilowatt-hour. This compares with a U.S. average retail electricity price in 1983 of 6.1¢ per kilowatt-hour, according to U.S. Department of Energy, *Monthly Energy Review*, September 1983.

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book review

by David Himmelstein and
Steffie Woolhandler

The Second Sickness: Contradictions in Capitalist Health Care

by Howard Waitzkin, Free Press, NY 1983

During the past decade there has been growing alarm over a "crisis" in health care. The costs of care have skyrocketed and the quality of care has shown little or no improvement. Health care expenditures in the U.S. rose from $65 billion in 1970 to $322 billion in 1982, while the infant mortality rate has remained among the highest of any developed country, and seems to be rising in some urban areas. Access to basic medical services is denied to many, while others suffer from excessive medical interventions.

The deepening crisis has spawned a wide variety of analyses and proposed solutions. In *The Second Sickness*, Howard Waitzkin shows that a Marxist perspective illuminates these larger aspects of health policy and organization as well as the seemingly technical aspects of medical practice. Waitzkin is a sociologist, a practicing physician and an active leftist. He combines political activism with wide personal experience, sensitivity, and a thorough knowledge of academic sources on medicine, sociology, and Marxism. This rare combination makes for a superb book.

In the first section of *The Second Sickness* Waitzkin analyzes the political, economic, and social origins of illness, and the distortions and irrationality engendered in our health care system by capitalism. In rich detail, Waitzkin shows how the drive for profit results in death and disability, as well as a health care system in which those in greatest need receive the least care. The third chapter of this section traces Marxist writings on the social origins of illness from Engels to Salvador Allende, placing current left theoretical work on health in the context of the rich but little known tradition of Marxist writings in this field.

The second section presents three fascinating studies of specific problems in health care. The first study is devoted to a careful and unsettling analysis of the growth of cardiac intensive care technology. In this brilliant essay, Waitzkin argues that while there is virtually no evidence that this technology benefits patients, it has been enormously lucrative for such corporations as Hewlett Packard and Warner Lambert. He traces the role played by corporations, doctors, philanthropists, and government officials in pushing for the universal adoption of this unproven technology, which resulted in billions of dollars in corporate profits. This chapter is the best Marxist analysis we have seen of the technical distortion of clinical medicine under capitalism. The author then moves on to the growth and wealth of exclusive private hospitals with the decimation of public hospitals which care for the poor and minorities. Waitzkin shows that while government spending for health care has increased dramatically since 1945, it has been devoted largely to private hospitals which serve the affluent and often destroy communities in the course of this government financed expansion. Here the author also examines the role of community clinics in filling the gaps in health care for the poor. We found Waitzkin's analysis of the prospects for community clinics too rosy, failing to see the pitfalls in segregating poor people's health care in a clinic system which is continually short of funds, increasingly bureaucratic, and often divorced from the community. The third study deals with the politics of the doctor-patient relationship, based on tape recordings of actual clinical encounters, some of which are reproduced and analyzed in detail. Here we see in intimate detail the distortion of the doctor's role under capitalism. The doctor becomes an enforcer of bourgeois ideology, a repairman of labor power concerned only with patients as producers, and an apologist for the current intolerable state of the world.

The final section explores prospects for resolving the contradictions of capitalist health care. Waitzkin examines health care in Chile under Allende and in Cuba since the revolution, describing the enormous advances made possible by the elimination of the barriers to health inherent in capitalism, and the fragility of these advances in the face of capitalist restoration. The detailed account of these two contrasting experiences makes concrete the central thesis of the book, that the most important determinant of health and health care is the social, ecomic, and political structure of society, not technical decisions about health policy and medical practice. The last chapter is devoted to discussion of health policy and sociomedical activism in the U.S. Here Waitzkin critiques reformist strategies, such as national health insurance and health maintenance organizations, which leave intact both the basic structure of capitalist medicine and the contradictions which underly it. Finally, he cites areas of work which he views as having progressive possibilities, such as advocacy of a publicly-controlled national health service, international solidarity work, and union organizing among health care workers.

This is a book rich in detail, exceptionally well and carefully documented, unconstrained by the usual bourgeois medical myths and sacred cows, and thoroughly readable. As with most good political works there is much to argue with. Waitzkin is overly optimistic about the prospects for alternative institutions and workers' control under capitalism. We disagree with his adoption of Andre Gorz' categories of "reformist" and "non-reformist" reforms, and in places would prefer more political economic analysis of medicine and less sociological description. But these are small quibbles. Those interested in an intimate and revealing look at capitalist medicine from a most cogent critic will find *The Second Sickness* to their liking. We hope that a more reasonably priced paperback edition will soon be available so the book can reach the wide audience that it deserves.

David Himmelstein is a fellow in the Division of Primary Care at Harvard Medicald School and the Cambridge Hospital.

Steffie Woolhandler practices medicine and teaches at the Boston University School of Public Health.

resources

RESOURCES FOR ACTIVISTS

Winning the Right to Know: A Handbook for Activists. Includes summaries of Right to Know Legislation from states across the country, contacts, reference lists, and first-hand accounts. 100 pages $7.00 from the Deleware Valley Toxics Coalition (DVTC) 1315 Walnut St. Rm. 1632 Philadelphia, PA 19107.

Occupational Health Resources, pamphlets, books, fact sheets, audio visual materials. Available from: Western Institute for Occupational and Environmental Sciences, Inc., 2520 Milvia St., Berkeley, CA 94704.

1983 Nuclear Power Safety Report, the fourth annual study by Public Citizen's Critical Mass Energy Project (see box on p. 30). Available for $5 postpaid from Critical Mass, 215 Pennsylvania Avenue, SE, Wash., D.C. 20003.

Monitor, bi-monthly newsletter of the Labor Occupational Health Program, $10/year, checks payable to The Regents of U.C. Available from: LOHP, 2521 Channing Way, Berkeley, CA 94720. Films, slideshows, books, pamphlets, catalog available.

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WOMEN

Women, Race, and Class, Angela Davis (New York, N.Y., Random House, 1981), 244 pp., $13.50. An interesting, radical-historian view on the feminist movement, the anti-slavery movement, the black-rapist myth, and other middle class achievements.

The Hearts of Men, Barbara Ehrenreich (Anchor Press, 1983), 206 pp., $13.95. Ehrenreich argues that men have been defying traditional sex roles long before the resurgence of feminism in the '60s by rejecting the "breadwinner ethic."

ENVIRONMENT

"Everyone's Backyard," newsletter published by Citizen's Clearinghouse for Hazardous Wastes. Reports national waste problems, explains legal procedures, etc. Available through Citizen's Clearinghouse, Box 7907, Arlington, VA 22707, with membership, $15.00.

Citizen's Guide to the NPDES Permit Program. Overview of the water discharge permit system. Natural Resources Defense Council, Attn: Toxic Water Watch, 1725 Eye St., NW, Suite 600, Washington, DC 20006.

Alternatives to the Land Disposal of Hazardous Wastes, prepared by the Toxic Waste Assessment Group (Office of Appropriate Technology, 1322 O Street, Sacramento, CA 95814).

A Guide to the Clean Water Act Amendments, U.S. EPA, Office of Public Awareness (Washington, DC, 20460) History of the Act and explanation of the major 1977 amendments. Free from U.S. Environmental Protection Agency, Washington, DC 20460.

* * * *

BOOKS

First Strike—the Pentagon's Strategy for Nuclear War, Robert Aldridge (Boston, South End Press, 1983), 320 pp., $8.50. Aldridge explains our dangerous nuclear weapons policy masked by "deterrence" and "national security."

Arming the Heavens: The Hidden Military Agenda for Space, 1945-1995, Jack Manno (New York, Dodd, Mead & Co.), $12.95. An "analysis of the ideologies and myths that lie behind the military space program."

Water and Power: The Conflict Over Los Angeles' Water Supply in the Owens Valley, William L. Kahrl (Berkeley, Univ. of California Press, January 1984), 588 pp., $10.95.

Loaded Questions: Women in the Military, W. Chapkis, ed., addresses such issues as "Do equal rights include the right to fight? Could feminists reform the military from within? Are women naturally pacifists?" and provides perspectives from around the world. 97 pp., $4.95, Institute for Policy Studies, 1901 Q. St., NW, Washington, DC 20009.

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BELGIUM: Gerard Valenduc, *Cahiers Galilee,* Place Galilee 6-7, B-1348 Louvain-la-Nueve, Belgium.

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