# SCIENCE FOR THE PEOPLE

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Vol. 14 No. 5


# NUCLEAR WASTE

## THE IMPACT OF WEAPONS PRODUCTION ON AMERICAN INDIANS • THE U.S. ECONOMY

# about this issue

The task of radically changing society takes a long time and requires collective action. Those of us who are often frustrated by the slow progress of today's leftist and grassroots movements may be encouraged by this issue of *SftP*. Several articles included here document how people are organizing around the issues they face in their own communities, and provide helpful information that others may use in local struggles.

"The Economics of the MX Missile" is an important source of information for activists in economic conversion campaigns such as Jobs with Peace. Gail Shields compares the number of jobs created by public spending for missiles versus equal spending for goods and services for peaceful uses. While she exposes the false logic military economists use to justify their demands for ever-increasing arms expenditures, Shields demonstrates that governmental spending for solar energy development, housing, day care, and other alternatives could increase the number of available jobs and stimulate industrial production.

In an interview with SftP, Winona LaDuke explains some of the ongoing liberation struggles of Native Americans, especially the fight to stop uranium mining. They are fighting for the preservation of the environment and control over their land. LaDuke discusses the differences between her society's respect for the land and consumer-based Western society's destruction of it. Native American struggles are seldom publicized in newspapers or mentioned on television, yet they are some of the most important in the United States today.

Challenging the need for advanced technology, LaDuke talks about creating a society that respects the land on which it depends. We'd like to know what you think. She raises controversial issues, and we hope her ideas will stimulate discussion in upcoming issues of *SftP*.

In "Asbestos in the Classroom" Nancy Zimmet takes you through the ten-year struggle of a small group of teachers, students, and parents to make their school safe. Zimmet, a teacher at Newton North High School, documents the difficulty of getting a group of local officials to authorize removal of the asbestos that was flaking from the school's ceiling. She evaluates the strategies of the removal task force, which eventually succeeded in getting the asbestos removed. Small groups like the one she describes seldom get widespread recognition. We need to learn from their triumphs and failures.

Some of us think feminism could radically change science. Unfortunately, women scientists have had little impact in the scientific community. Leanna Standish, in "Women, Work, and the Scientific Enterprise," introduces a provocative feminist theory that explains why many women have felt alienated in the scientific work environment. Standish challenges women to form science collectives as a way to overcome their alienation and gain control over their work.

Larry Goldsmith reviews the Kinsey Institute publication, "Sexual Preference: Its Development in Men and Women." This report has received widespread publicity for its conclusion that homosexuality is biological. Goldsmith points out that the study begins with the false assumption that a clear division exists between homosexuality and heterosexuality, and that homosexuality is a distinct aberration. Scientific studies of homosexuality never define homosexuality clearly; instead they search for causes. Try to imagine the Kinsey Institute studying the roots of heterosexuality. The Kinsey study is dangerous because it fuels intolerance of gay people, and it contributes to the spread of the idea that victims are responsible for their own oppression.

Sue Tafler provides an in-depth review of David Weir and Mark Shapiro's book, *Circle of Poison*. Tafler describes how pesticides banned in the U.S. are exported to Third World countries. Because it carefully documents how the U.S. government allows the importation of food grown with banned pesticides, *Circle of Poison* is an important resource for teachers and activists. If you'd like to help stop the circle read the News Note "New Global Network Target Pesticide Abuse." The Pesticide Action Network is dedicated to ending these practices.

**UPCOMING ISSUES OF SFTP**

The SftP Editorial Committees are now soliciting articles for the Jan/Feb 1983 special issue on "Towards a Science for the People." This thematic issue will celebrate volume 15 of the magazine and will articulate our vision of a people's science.

The East Bay Editorial Committee is now soliciting articles for the March/April 1983 special issue on "Technology and Repression."

Please send articles, outlines, graphics, and other materials to: Science for the People, 897 Main St., Cambridge, MA 02139. To contact the East Bay Committee write Science for the People, P.O. Box 4161, Berkeley, CA 94704.

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# news notes

## NEW GLOBAL NETWORK TARGETS PESTICIDE ABUSE

An international network to halt the worldwide proliferation of hazardous chemical pesticides has been formed by non-governmental organizations from more than 20 countries. The birth of Pesticide Action Network (PAN) International took place at a conference on the global pesticide trade recently in Penang Malaysia.

At the conference Third World representatives testified about the terrible toll chemical pesticides are inflicting around the globe. Conference speakers estimated that a minimum of 375,000 people are poisoned yearly in the Third World, 10,000 fatally. In Sri Lanka alone, hospital records indicate that more than 15,000 poisonings and 1,000 fatalities occur annually.

In addition, conference participants heard of fish kills in Bangladesh, contaminated food in Thailand, pesticide residues in mother's milk and fat tissue in Thailand and India, resistance among disease-carrying insects, and of a "tread-mill" of pesticide dependence throughout the Third World from Kenya to Brazil to the Philippines.

Conference speakers also stressed that chemical pesticides are but one aspect of the larger structural problem facing Third World agriculture. These include the increasing dependency resulting from the dissemination of modern agricultural technology under the influence of international aid, financial, and commercial institutions. As a result traditional self-reliant practices and traditions of Third World farmers are being lost, perhaps forever.

PAN International has called for:
- The expansion of traditional, biological, and integrated pest management and an end to the unnecessary sale and use of chemical pesticides;
- The imposition of export and import controls on the movement of hazardous chemical pesticides from industrialized to Third World countries, and among Third World countries themselves;
- Immediate notification by any government whenever it bans or restricts a chemical pesticide;
- Public release of information by all governments on the export and import of chemical pesticides, including the names of companies involved; and the amounts, values, and known health effects of the products sold;
- The development, wherever practical, of non-use or minimal-use of chemical pesticides in order to encourage local self-reliance in Third World agricultural areas, including local control over production, use, and consumption of food and other resources;
- The withdrawal of financial support by all international funding and development agencies of any Third World project utilizing pesticides which cannot be safely used under Third World conditions;
- Reversal of the practice by nine international "Green Revolution" research centers of developing and distributing seed varieties which are heavily dependent on expensive and hazardous inputs like chemical pesticides and fertilizers;
- An end to the vicious circle whereby hazardous pesticides applied in the Third World end up as residues in food products consumed by people all over the world, as well as contaminants in water, soil and the environment generally.

For more information contact: The Institute for Food and Development Policy, 2588 Mission St., San Francisco, CA 94110.

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## "DON'T WORRY ABOUT THE NUCLEAR FREEZE"

In his investment advice column in the *Boston Globe* on May 9, 1982, Michael Johnson explains how to make money from the arms race. His remarks point out some important gaps in the strategies of the disarmament movement.

Johnson's comments on the MX were, "The delay which will ensue as poorly planned systems, such as the MX missile, are beaten back does a great disservice to the military. ..."

His thoughts on the arms race included, "Simply put, the Soviets have developed systems which are now equal to or marginally superior to American sixties level hardware. New American equipment—the Abrams tank, the Trident submarine, the F-14/15/16/18 aircraft—will once again reestablish a "generation gap" in the field. And that, of course, will fuel another surge in Soviet military deployments into the 21st Century."

Johnson remarked that the Cruise missile is "a truly elegant solution, typical of what America can do if it so desires. ...Best bet is to buy the electronic technology which permits this revolutionary accuracy."

He concluded, "Don't worry too much about the nuclear freeze movement. Their target is to limit what are, in essence, first-generation nuclear weapons. Concentrate instead on second and third generation systems. Best bets are the component producers of 'Star Wars' weaponry—particle beams, microwave beams and laser cannons."

For another point of view take a look at "Laser Fusion: Image and Reality of a Military Program" in SftP, vol. 13 no. 4, July/August 1981.

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## SCIENTIFIC DIVING AND OSHA

Ever since OSHA passed the Commercial Diving standard in 1977, scientific divers (marine biologists and others) have complained that it should not apply to them and was too much of a burden. With the new administration, their pleas have not fallen on deaf ears. In its deregulatory fervor OSHA is anxious to accede to the scientists' requests.

In March 1982 OSHA proposed such an exemption for all scientific divers doing marine research for educational institutions and left the door open for the possibility of exempting other scientists. The request brought in over 160 comments, almost all of them from scientific divers in California requesting exemption. The only objection came from the Carpenters Union who were concerned that their members, commercial divers, will be exempted when they do contract work, such as environmental impact statements. The

union suggested that, instead of an exemption (in which case no standard would be legally enforced), they should apply for a variance. OSHA would enforce their own scientific diving standard after determining whether it was equally effective.

One of the main concerns for the scientists was the requirement that they provide a recompression chamber for divers diving below one hundred feet of sea water or for dives which will require decompression. On such dives, an emergency ascent could result in decompression sickness (the bends), and lead to neurological damage (even spinal cord injury), osteonecrosis (bone degeneration), or death. They believe that their safety precautions and the buddy system are sufficient to prevent problems. However, if an accident occurs, a diver has only 3½ minutes to get into a recompression chamber and be compressed back to depth. The scientists claim the requirement is too costly. Yet according to their figures, only 3.2% of their dives would require it at an average cost of about $1,000 per dive, which is small compared to the liability if someone dies.

Hearings were held in June and July this year. Almost all the scientists testifying were from California and thus covered by the California OSHA regulations on scientific diving. They touted their excellent safety record as evidence that they could regulate themselves and the government should get off their backs. They claimed that they had only 5 fatalities during over 1.7 million hours of diving. This works out to .55 deaths per 200,000 person-hours. They did not recognize that this is equivalent to 1 death per year in a plant with 181 full time workers.

It is a forgone conclusion that OSHA will exempt the scientists. However, at least for a time they had to consider themselves as workers and that they were not immune to job hazards.

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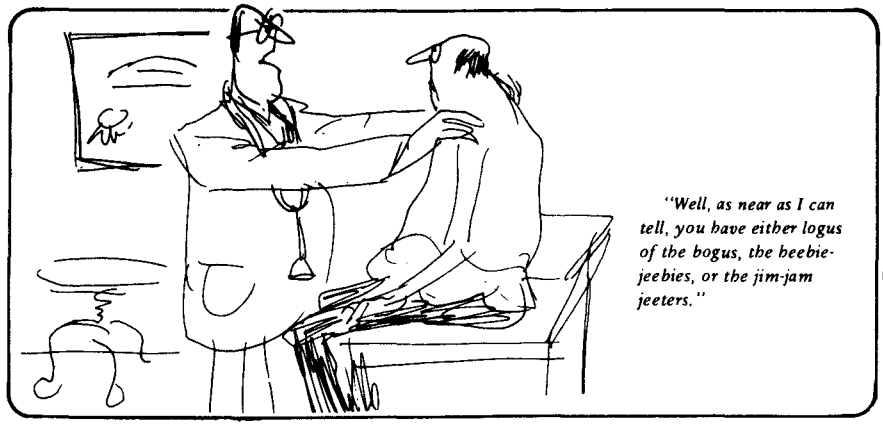
## "WE'VE BEEN PRESCRIBING IT FOR YEARS..."

I first heard about the drug Benedectin three years ago when I was pregnant with my first child. I was experiencing a rather serious bout of morning sickness that lasted two months. In its most severe stage, I was vomiting from six to ten times a day. I stayed in bed, ate crackers, and lost weight. After a couple of weeks of this I began to buckle under to the claims of my doctor and nurse that I should use Benedectin. I had been strongly opposed to using any medication during pregnancy, but I was worried about whether the fetus would suffer if the sickness continued. Ironically, standing in the checkout line after filling the prescription for Benedectin, I noticed the lead article in the current issue of the *National Enquirer* which highlighted the abnormality called "lobster claw" attributed to the use of Benedectin. The article was well-written and suprisingly well-documented. There were several lawsuits in England and the U.S., against Merrell Down Pharmaceuticals, the manufacturers of the drug.

Benedectin had originally been put on the market as an anti-nausea drug for motion sickness, but it had never been properly tested for use by pregnant women. In fact it had never been administered to a pregnant animal. A week or so after the *National Enquirer* article appeared, a similar article from the *Washington Post* was forwarded to me by friends.

When I confronted my doctor and nurse with the two articles, they chided me for having purchased the *Enquirer* and dismissed the *Post* article for not presenting conclusive evidence. Determined that I was not going to present them with conclusive evidence in the delivery room, I continued to abstain from using the drug. Eventually, the morning sickness passed. I gave birth to a ten pound beautiful, healthy baby.



*"Well, as near as I can tell, you have either logus of the bogus, the heebie-jeebies, or the jim-jam jeeters."*

*Neffield News/cpf*

I was pleased to read in the July 14 *Guardian* that the FDA has required the manufacturers to enclose a warning leaflet in every packet of Benedectin. Unfortunately, a lot of people will throw away the leaflet without reading it. Furthermore, it is pathetic that this flimsy attempt at regulation comes two or more years after the first tragic reports of deformed babies. Indeed, my own doctor will probably go on telling patients, as he told me, "We've been prescribing it for years..."

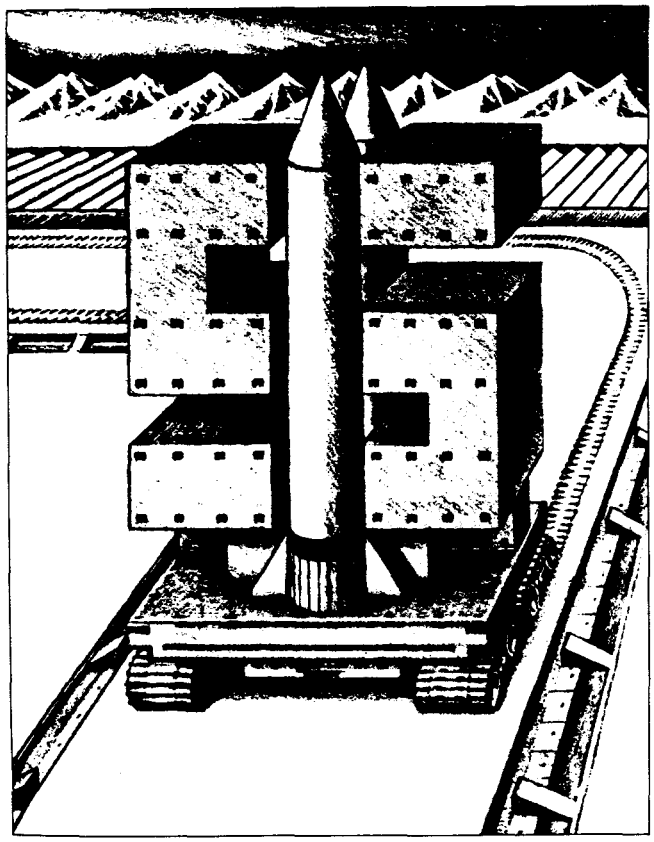
Let's hope women and men are relying less on the authority bequeathed on physicians and government administrators by a system that puts profits before people.

*—Beverly Chorbajian*

## What Are the Real Costs?

# THE ECONOMIC IMPACT OF THE MX MISSILE

**by Gail Shields**



Bob Gale

Over the five year period, 1981-1986, the Pentagon budget is projected to total approximately $1.5 trillion. In annual figures with low inflation assumption, it will rise from $136 billion in 1980 to $257 billion in 1983: an increase of 89% in three years. The projection for the 1987 Pentagon budget is $400 billion, a 194% increase during the 1980s.[1] If the inflation assumptions inherent in the numbers were more realistic, we could easily expect the military budget to be in the $600 billions by the late 1980s unless there is a strong movement to stop the arms race.

The jump in arms spending that began under Carter is largely meant to finance the development of two new weapons systems: the MX missile and the Navy's new nuclear arsenal, which will substitute for military bases being lost in the third world.[2] Much of the increase will cover only the rapidly rising costs of systems already in production. The Pentagon's demand for a plethora of highly sophisticated weaponry is resulting in fewer weapons at a higher overall cost. Much of this is due to the rapid rise in the cost of metals, materials, and labor necessary to produce the items. The industries affected by the big defense push were already operating at high levels of capacity; and competing demands for their use among industrial sectors sent prices shooting into the 100% increases.

Unlike the Carter Administration, Reagan has not claimed that a huge increase in the military budget will help the economy. Rather he has indicated that the arms buildup can be offset by corresponding cutbacks in social services and other non-military federal programs.

The administration is assuming that all government programs have the same economic impact: in their view military spending will create as many jobs as foregone alternatives, and inflationary effects can be controlled by economizing elsewhere. In fact, as we will see, there is a marked difference in the impact on the economy of military versus alternative social service expenditure patterns, and often the impact is opposite to what conventional economic wisdom implies.

As the Pentagon budget grows, social services will shrink even faster: a cutback of roughly $62 billion is planned for 1983. Those most in need have been the hardest hit by these cuts, namely poor women and their

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*Gail Shields is a graduate student at the New School for Social Research in New York city. She is a member of the Massachusetts' Women's Commission in Exile (dismissed by Governor King for opposing welfare cuts). She works in its Economic Literacy Project with groups such as NOW and the Coalition for Basic Human Needs.*

*The study described in this article was made for the Council on Economic Priorities, (CEP). It is excerpted in CEP's* Misguided Expenditures, *David Gold, et al., Council on Economic Priorities, New York, NY, 1982.*

children. The administration will cut 300 thousand units of section 8 low income housing. Overall, low income housing appropriations will be cut by $23 billion, the largest single reduction of any program and almost one third of the total budgetary cuts. Funding for mass transportation, day care and social service programs, and alternative energy programs is also being cut. What is the real impact of this shift from civilian to weapons spending likely to be?[3]

**The Air Force Study**

The controversial MX system and its selling to the public is a good example of how the economic effects of military spending can be obscured by an imprecise economic analysis. In lobbying for a program whose total costs have been estimated at between $33 billion and $100 billion, the Air Force has released only one study of the economic consequences of the project. This is a study of the Full Scale Development Phase of the MX missile, that is, the development and building of prototypes for the missile.[4]

The Air Force study, which received wide newspaper publicity in 1979-1980, claimed that a billion dollars of investment in missiles would produce 130,000 new jobs, a preposterously high figure.[5] The study used two methods. One, a general econometric model developed by Albert Hirsch of the Commerce Department, was applied inappropriately and was far too aggregate to reflect particular conditions in the missile industry. Hirsch himself, now head of the Econometric Studies Branch in the Commerce Department, considered the study a misuse of his methodology.

The other method used was based on the more detailed input-output tables prepared by the Commerce Department—a good start, since these show the complex interrelationships of different industries. Using them, one can measure *secondary output*, that is, one can tell how much an increased demand for the products of one industry (missiles in this case) will stimulate demand for the products of other industries. The Air Force, however, incorrectly combined secondary output with the results of increased buying by the employees of the missile manufacturers and supplier industries. This, of course, exaggerated the economic benefits of expenditure on missiles. In addition, the Air Force made no comparison with spending alternatives.[6]

**An Alternative Approach**

What follows is the kind of study that the air force would have done if its goal had been anything other than bolstering its case for the MX system. This study measures the economic impact of spending for missile production in five ways:

1. By the amount of secondary output generated for each dollar of expenses on missile production (Table 1).
2. By the number of jobs created, directly and indirectly, per billion-dollar increase in spending (Table 2).
3. By the impact of the available supply of labor and materials on the affected industries (Table 3).
4. By the distribution of the secondary output among various manufacturing and service industries (Table 4).
5. By the percentage of the output that is in the key capital-intensive industries which produce equipment essential to the production of goods in other industries.

In addition, since there is generally perceived to be a trade-off between military and civilian spending, I have made these same five calculations for federal expenditures for several widely favored alternatives, ones which are being sacrificed to weapons production: solar-collector manufacturing (solar energy), housing, manufacture of subway cars and buses (mass transit), repair of water mains and bridges, building of sewage treatment plants (public utilities construction), and railroad manufacturing. Each of these alternatives would generate more jobs, stimulate more production in the lagging key heavy industries, and have fewer inflationary effects than missile production.[5]


Guardian/cpf

In conducting this study, I have assumed that production of new missiles or alternatives is done with existing plant capacity. I have compared the interindustry effect of producing missiles with the effect of producing alternatives by using the key concept of *secondary output*.[7] For each product manufactured, suppliers benefit, the suppliers' suppliers benefit, and so on.

For example, automobile manufacture relies on products from the steel, glass, rubber, and oil industries. Each of these industries has its own sup-

Table 1: Secondary Impact Of Spending Alternatives Per One Dollar Increase In Final Demand

| Alternative | Total Secondary Output |
|---|---|
| Complete Guided Missiles | .937468 |
| Mass Transit | 1.629950 |
| Solar Energy* | 1.781749 |
| Railroad Manufacturing | 1.528690 |
| Public Utilities Construction | 1.261800 |
| Housing | 1.250400 |

Source: Derived from the Bureau of Labor Statistics, Office of Economic Growth, Department of Labor, 1972 Input-Output Study, INVC 1973.

*Craig Peterson, "Sector-Specific Output and Employment Impacts of Solar, Space and Water Heating Industry, "prepared for the National Science Foundation. Research Applied to National Needs (RANN), December 1977. The Commerce Department's Input-Output tables do not include Solar Energy Manufacturing as an industry, so Peterson calculated the multipliers using the same principles as are embodied in the Input-Output tables.

pliers: coal mining companies supply materials for making steel; container manufacturers and, again, steel manufacturers provide products used in making glass. To find the secondary output of steel in producing an automobile, one measures the amount of steel directly used in the automobile, the amount of steel used in producing glass for the automobile, and so on. These amounts are totalled to obtain the secondary output of the steel industry in producing the automobile.

Thus, the *total secondary output*, or *secondary impact*, of spending in one industry is the combined benefits to other industries. Thus, the total secondary output of producing the automobile is the sum of the secondary outputs for the industries whose products are directly or indirectly used by the automobile industry; this sum does not include the automobile itself, which is the *final demand* in this example. The total secondary output is the measure of the interindustry impact of producing the automobile; it tells us how much other industries are stimulated (see box for more details).

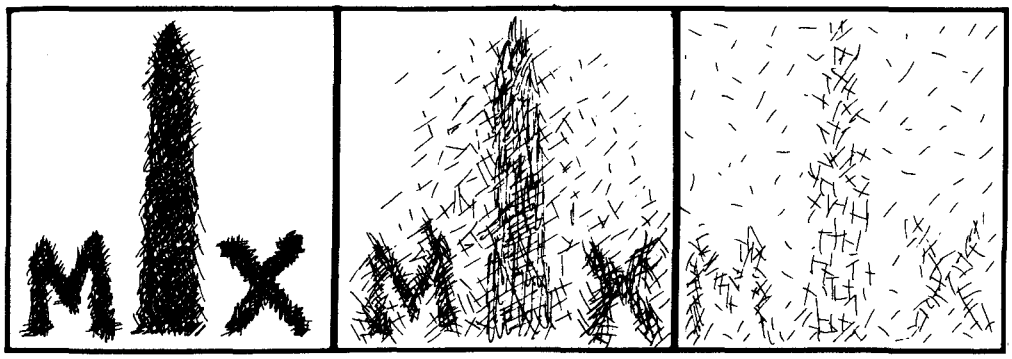
Table 1 shows the total secondary output generated by a one dollar increase in final demand in the six industries considered. In the case of missiles, the total secondary output is 0.937468. That is, for each one dollar increase in final demand for missiles, 94¢ of interindustry output is generated. The table shows how this compares with the alternative expenditures.

This is a key table, since the secondary output figures are relatively constant; they depend on how an industry uses products of other industries and thus change only when the technology does. The figures do not depend on the relative prices of products (except when cheaper materials are substituted for more expensive ones as in the change from wood to fiberglass in producing boats).[6] The table shows that with the technology used in 1973 (the most recent year for which figures are available), mass transit has about a 75% larger secondary impact, residential construction a 33% greater secondary impact, and solar energy manufacturing a 90% greater secondary impact than guided missiles. This means that solar energy manufacturing is almost twice as effective as missiles in keeping other industries going. Moreover, because supply constraints in the missile industry lower its secondary impact, as we will see, the advantages of alternative expenditures are relatively greater than suggested here.[8]

**Labor**

In a time of high unemployment such as the present, the most important consideration in any assessment of economic impact is likely to be job creation. Table 2 shows the employment generated by equal expenditures for missile production and the various alternatives I have discussed.[9] I have added another category, day care, to show the job-creating potential of social programs providing personal care. In this table day care and missiles stand out as opposite extremes in the potential they have for stimulating increased employment.

Figures in the column labeled Indirect Employment in Table 2 are derived from the Bureau of Labor Statistics by first multiplying each figure for secondary output needed to produce $1 billion of final demand by the ratio of employment to unit of product in the supplier industry, and then summing for all the supplier industries. The direct employment figure in mass transit is




*Beverly Chorbajian*

the number of workers who would actually take part in building $1 billion worth of final demand, e.g. subway cars or buses.

All of the figures for employment impact, like those cited for total secondary output, were calculated by considering only the production phase within the named industry. For example, figures for employment in mass transit do not include jobs resulting from the construction of new subway systems or the maintenance required by increased use of transit; only the actual manufacture of buses and subway cars is considered here. For all of the alternatives to missile production, this focus results in a substantial underestimation of both the industrial impact and the employment impact of increased funding. As long as the missile is made to sit in a hole, however, it can create few jobs beyond those directly related to its own manufacture.


Carol Simpson

**Supply Constraints**

Up to this point in the analysis, I have assumed that there are no supply constraints in any of the industries. In other words, I have assumed that increased production will not be impeded by shortages of either materials or labor in any of the industries that contribute to the final product. The Air Force, in its study of the impact of the MX, assumed this as well. Of course, this is not a safe assumption to make, as evidenced in Table 3. In the table we see the rate of capacity utilization (CU) as well as the percentage of total secondary output generated, in those major industries that contribute resources to the production of missiles and the alternatives for the last quarter of 1981.[10]

Table 3 shows that missile production is experiencing severe constraints; the four major supplier industries are operating at very close to full capacity.[11] Industries producing aircraft, electronic components, communications, and machine shop products were all operating

Table 3: Major Industrial Requirements And Current Capacity Utilization

| Industry | % of Total Secondary Output | Capacity Utilization 1981 |
|---|---|---|
| **MX Missiles** | | |
| Aircraft | 20.0 | 96.0 |
| Misc. Business Services | 7.0 | — |
| Travel, Entertainment & Gifts | 5.0 | — |
| Electronic Components | 3.8 | 90.0 |
| Communications | 3.4 | 99.0 |
| **Mass Transit** | | |
| Motor Vehicles | 23.9 | 61.0 |
| Blast Furnaces and Basic Steel | 7.5 | 63.0 |
| Metal Stampings | 3.9 | 82.0 |
| Iron and Steel Foundries | 3.8 | 56.0 |
| **Solar Energy** | | |
| Solar | 17.7 | — |
| Steel | 11.1 | 68.0 |
| Copper | 10.5 | 81.0 |
| Plastics | 6.3 | 91.0 |
| Aluminum | 5.4 | 80.0 |
| Gen. Industrial Machinery | 3.4 | 92.0 |
| **Railroad Manufacturing** | | |
| Steel | 17.8 | 63.0 |
| Railroad Equipment | 13.0 | 39.0 |
| Iron and Steel Foundries | 8.3 | 56.0 |
| Engines-Turbines | 4.8 | 68.0 |
| Machine Shop Products | 4.5 | 87.0 |
| Aluminum | 3.8 | 53.0 |
| **Public Utilities Construction** | | |
| Cement Concrete Products | 23.9 | 76.0 |
| Primary Copper | 10.1 | 56.0 |
| Copper Products | 10.1 | 81.0 |
| Blast Furnace and Basic Steel | 8.8 | 63.0 |
| Fabricated Struc. Metal | 8.3 | 82.0 |
| Wholesale Trade | 3.3 | — |
| Misc. Business Services | 3.2 | — |
| Other Fabricated Metal Products | 3.1 | 78.0 |
| **Housing** | | |
| Millwork and Plywood | 8.0 | 69.0 |
| Sawmills and Planing Mills | 6.5 | 73.0 |
| Cement, Concrete | 5.2 | 76.0 |
| Professional Services | 4.4 | — |
| Wholesale Trade | 3.9 | — |
| Fabricated Metal Prod. | 3.7 | 85.0 |
| Retail Trade | 3.6 | — |
| Blast Furnace and Basic Steel | 3.2 | 63.0 |

Sources: For total requirements: U.S. Department of Labor, Bulletin 2056, B.L.S. Feb. 1980, Vol. II. For CU rate: Wharton Econometric Forecasting Associates, "U.S. Capacity Utilization Rates," 4th quarter 1981, Table 4, Detailed Industries. April/May 1982.

at 100% capacity throughout 1979 and 1980, according to these figures, and are still operating at over 90% capacity.

The secondary impact of missile production will be smaller than calculated, therefore, since increased missile production must entail a shift of resources and equipment away from other industries. This, in turn, will be sure to bring about price increases, as more money chases after the same quantity of productive resources.

This is not the case with the alternatives to missile production: all of these have considerable unused capacity for expanded production. For example, the steel industry, a major supplier to four of the five alternative industries described, has dropped from a high 77% CU in 1979 to 63% in the last quarter of 1981. In the suffering auto industry, truck and bus production went from 58% CU in late 1979 to 37% in 1981.

**Labor Constraints**

Labor constraints are more difficult to estimate than supply constraints since no periodic index of occupational unemployment is available. However, a look at recent trade literature can give some notion of the employment situation in each industry. Due to the boom in construction of civilian aircraft between 1978 and 1980, the concurrent increase in military spending occurred during a severe labor shortage in the aerospace industry. In many companies full capacity did not hinder production; instead a lack of trained engineers and technicians kept production down from 1978 until 1981. In another industry integral to missile production, the National Machine Tool Builders Association found that 70% of its member firms reported significant labor shortages in 1980.

The opposite situation exists in industries essential to the alternative programs. Because of recent layoffs, the auto industry currently has an unemployment rate of 29%, and lumber and wood workers have a rate of 15%. Since missile production requires a much higher proportion of professional workers than the alternatives, it is significant that unskilled and semiskilled nonfarm laborers have the highest unemployment rates (15%) whereas professionals and managers have the lowest (2.7%).[12]

Table 4: Secondary Impact On Key Manufacturing Industries

| | Services | Total Manufacturing | Key Manufacturing | Construction Agriculture & Mining |
|---|---|---|---|---|
| Complete Guided Missiles | 36.0 | 60.0 | 14.4 | 3.5 |
| Mass Transit | 20.0 | 77.0 | 30.0 | 3.3 |
| Solar Energy | 11.0 | 85.3 | 33.9 | 3.5 |
| Railroad Manufacturing | 22.1 | 74.0 | 46.2 | 4.1 |
| Public Utilities Construction | 27.9 | 66.0 | 40.0 | 6.0 |
| Construction Housing | 32.5 | 61.0 | 18.0 | 5.8 |

Source: Derived from the INVC 1973, Leontieff Inverse Matrix: (I-A)'1, U.S. Dept. of Labor, Bureau of Labor Statistics, Office of Economic Growth, 1980.

We can safely assume that missile production faces a fixed, barely adequate supply of both capacity and labor in the near future. The alternatives, on the contrary, face almost infinitely elastic supplies of both capacity and labor. The secondary impact projections for the alternative industries, therefore, are much more realistic than those for missile production. In the case of missiles, growth in both production and employment is severely limited by price increases, imports, and the shifts in resources that are already being made.

**Distribution of Secondary Impact**

There has been much discussion lately about "reindustrialization." When we break down the total secondary output from missile production and alternative

Table 2: Economic Impact of Spending Alternatives
Numbers of Jobs per One Billion Dollars

| Alternative | Direct Plus Indirect Employment | Direct Employment | Indirect Employment |
|---|---|---|---|
| Complete Guided Missiles | 53,248 | 25,055 | 28,193 |
| Mass Transit | 77,356 | 25,055 | 28,193 |
| Solar Energy | 57,235 | * | * |
| Railroad Reconstruction | 54,220 | 20,260 | 33,960 |
| Public Utility Construction | 65,859 | 32,173 | 33,686 |
| Housing | 68,657 | 31,076 | 37,641 |
| Day Care | 120,496 | 103,608 | 16,888 |

Sources: Derived from the U.S. Department of Labor, Bureau of Labor Statistics, Office of Economic Growth, Charles Bowman, Employment inverse 1977, in 1973 dollars. Peterson, *Sector-Specific Output and Employment Impacts of Solar, Space and Water Heating Industry*, cited earlier; Leonard S. Rodberg, *Employment Aspects of the Solar Transition*, prepared for the Joint Economic Committee of the Congress, Subcommittee on Energy (Washington, D.C.: Public Resource Center, 1978).
*Figures unavailable

Table 5: Distribution of Total Secondary Output Among Key Manufacturing Industries

| | Missiles | Mass Transit | Solar Energy | Railrd. Manufac. | Public Utilities | Housing |
|---|---|---|---|---|---|---|
| Steel, Blast Furnaces | 2.0 | 7.5 | 10.0 | 16.0 | 8.8 | 3.2 |
| Forging and Foundries | 0.7 | 3.8 | 0.3 | 7.5 | 2.3 | 0.6 |
| Copper Products | 0.9 | 1.6 | 10.2 | 1.9 | 10.1 | 2.7 |
| Aluminum Products | 2.1 | 2.0 | 5.9 | 3.5 | 1.9 | 0.9 |
| Nonferrous Products | 1.3 | 1.1 | 2.1 | 1.5 | 1.6 | 0.6 |
| Heat Fixtures, Plumbing | - | 0.1 | - | 0.1 | 0.2 | 1.6 |
| Structural Metal | 0.1 | 0.3 | 0.2 | 0.7 | 8.3 | 3.7 |
| Screw Machines | 0.7 | 0.8 | - | 0.6 | 0.4 | 0.3 |
| Metal Stampings | 0.6 | 3.9 | 0.5 | 0.4 | 0.3 | 0.3 |
| Hand Tools, Cutlery | 0.3 | 1.4 | - | 0.2 | 0.3 | 0.7 |
| Other Fabric, Metal | 1.0 | 1.9 | 0.6 | 2.3 | 3.1 | 1.6 |
| Turbines, Generators | 0.2 | 1.1 | 0.2 | 4.4 | 1.0 | 0.1 |
| Other Metal Working, Construction and Mining Equipment | 1.4 | 1.7 | 0.8 | 2.3 | 1.0 | 0.7 |
| General Industrial Machines | 0.8 | 1.1 | 2.9 | 4.1 | 0.5 | 0.6 |
| Machine Shop Products | 2.2 | 1.4 | 0.1 | 0.6 | 0.5 | 0.3 |
| Total Key Manufacturing Impact | 14.4 | 30.0 | 33.9 | 46.2 | 40.3 | 18.1 |

Source: Derived from U.S. Department of Labor, Bull. 2056, Table 3, Feb. 1980.

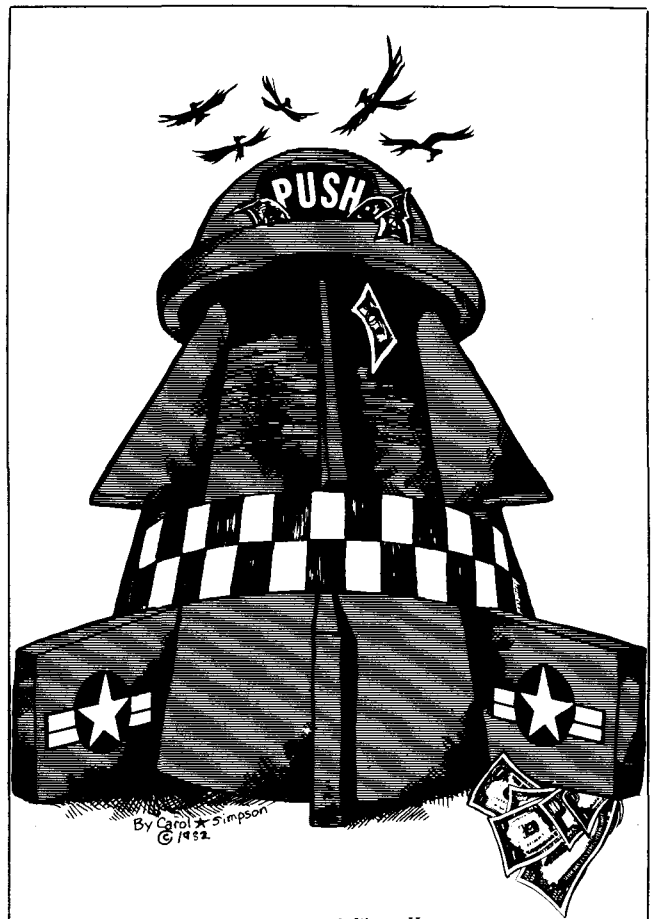
programs according to economic sector, we find that spending on missiles has proportionately less impact on manufacturing and more impact on services than any of the alternatives.

Generally, services are considered a drain on the economy. They are thought to drain investment from the more capital-intensive areas of the country's industrial base and, thus, to drag down productivity levels and impair America's competiveness in the world economy.[13] This idea is often expressed in current debate over reindustrialization and the decline of the auto and steel industries. Thus, the high demand for services created by missile production is a significant drawback to increased spending for this purpose.

The first two columns of Table 4 show the percentage of secondary output in services and in manufacturing generated by missile production and the alternative industries.[14] They show that 85% of the secondary impact of solar manufacturing occurs in manufacturing, compared to 60% for missiles.

The third column shows that this disparity is even greater in the key manufacturing industries. Only 14.4% of the secondary impact of missile construction is in key industries, compared to over 30% for mass transit and solar energy, 40% for public utilities construction, and 46% for railroad manufacturing.

Table 5 lists key industries and the relative percentages of total secondary output for missile production and alternative programs.[15] The findings shown by these two tables call into question an argument that is sometimes made in favor of military spending. As Harold Brown, then Secretary of Defense, expressed it in testimony before the Senate Budget Committee in 1980, military expenditures "are beneficial in the longer




M-X: Deposit Waste Here

(Continued on page 35)

## Solitary Science vs. Connected Collectivism

# WOMEN, WORK, & THE SCIENTIFIC ENTERPRISE

**by Leanna Standish**

For the last eleven years of my life I have been working as a physiological psychologist. During those years I have often felt a deep sense of failure, disappointment and vague anger. Until recently I believed that my personal difficulties as a scientist were unique to me—that my sense of failure to contribute to the scientific enterprise had to do with some tragic personal flaws. It never occurred to me that my experience of scientific institutions and of myself as a scientist might be gender-related. I have since learned that other women working in science have similar psychological experiences. Our common experience can be better understood through the psychological and sociological analyses of contemporary feminist thinkers such as Nancy Chodorow, Evelyn Fox Keller, Jane Flax, and Dorothy Dinnerstein. Feminist theory and my experience as a woman scientist forces me to ask: How can women scientists influence the future of our culture? Should we, or can we, alter the masculine orientation of scientific enterprise? How can women living and working in the last decades of the twentieth century think, experiment and make changes of cultural significance?

For the first time in history more than a few women are entering the sciences as students, many continuing on as scientists, professors, and physicians. Much of this change is a post-war phenomenon. At the end of the second world war, an optimism swept the nation; a national sense that anything was possible. The middle class men and women who parented my generation believed that their children could have and be anything if they simply worked hard enough. In the late 1940s and 1950s, though sex-role stereotyping was in its heyday, girls as well as boys received the powerful message of limitless individual possibility. Education seemed the means to all ends. For many of us, college was the inevitable consequence of high school graduation. Our intellectual potential was valued; occasionally we, as well as our brothers, received chemistry sets as holiday gifts. We read Nancy Drew and Landmark books about Madame Curie and Florence Nightingale. A tomboyish exploratory spirit was amusedly tolerated and sometimes even encouraged.

As young women we entered the university, some finding ourselves in small elitist colleges for women, and in this rarified environment we began to take ourselves seriously as thinkers and doers. We knew early on that college was just the beginning. There would be graduate school, medical school, law or business school afterwards. We had only vague notions of ourselves as successful women professionals, of self-actualization, power, and commitment to a purpose larger than ourselves. There were few models by which we could verify our nebulous fantasies. But as members of the new "liberated" generation, we saw ourselves as masters of our own scientific destinies. The abundance of male models seemed adequate enough. It never occurred to most of us to think that our gender, our femaleness, could or would stand in our way. This blindness, this denial of our difference, helped to save us from the immediate alienation and failure so many of our fellow women students experienced. Sex discrimination in the university seemed only to be a childish relic of the past. It seemed then that only we ourselves and our private inadequacies could prevent us from assuming important positions in the adult world of creative and deeply satisfying work.

Some of us were accepted for the small number of medical or graduate school slots allotted to women. Some of us managed four or six years ending in a degree and entrance into a professional career, but most of us did not. I have known many women who left graduate

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*Leanna Standish is beginning the first attempt at forming a women in science collective at Smith College. She is working on research on epilepsy and the brain.*

Acknowledgements: *Thanks to Helen S. Brown and Judith Poole for editorial help.*

or medical school with feelings of vague alienation, in fear of facing competence exams, or in despair over the so-called writing block. I have known women, who after years of daily viscera-gnawing anxiety, mumble that they are still working on their dissertations.

A few of us stayed in school, though; we somehow received the necessary intellectual and emotional support. Perhaps there was a paternal male advisor, a rare female mentor, or other female students who formed what later came to be called support groups. Or perhaps the magic thing that happens so often to our male counterparts happened to us: we became captivated by the very subject matter before us. Our fascination with our work carried us through long periods when few around us seemed to care about what we were doing. Those of us who completed the process appended initials to our names and prepared to claim our share of grants, fellowships, faculty positions, administrative power, and journal, laboratory, and office space. It seemed that influencing the course of science and claiming our place in the policy-making hierarchy depended only on our hard work and our ill-conceived notion of self-discipline.

***To strive to do valuable work as a female scientist is to strive for access to a part of society that embodies the quintessential values of patriarchal culture. The very word science implies masculinity.***

Now, however, many of us face the tortuous realization that we are having little impact on the world. We fear our commitment to a higher purpose is waning, and we find it harder and harder to take ourselves seriously as thinkers. We notice that our male colleagues also fail to take us seriously. We blame ourselves and our secret tragic flaws. What has happened to our energy and sense of purpose? Our answers are often full of self-blame: things would be different if I worked harder; if I had more technical training; if I learned to program computers or design electronic circuits; if I wrote more fluently or read and thought more quickly; if I were more assertive, decisive, or articulate. We daily experience a sense of failure and alienation.

We must understand that we are struggling among men—in a centuries-old social environment created by men. As one ascends the scientific hierarchy one sees fewer women and more men. At the undergraduate women's college where I teach, only 38 percent of the faculty are women, many of whom are untenured. At the prestigious biomedical research institute where I spent a postdoctoral year, only two of the fifty research faculty members were women, and they were married to two of the most influential male faculty members.

To strive to do valuable work as a female scientist is to strive for access to a part of society that embodies the quintessential values of patriarchal culture. The very word *science* implies masculinity. For many men, a central goal of creative enterprise is self-sufficiency. The male scientist tacitly accepts that to do good science one must do it alone. He favors isolation from colleagues working on problems similar to his own and from assistants working *for* him, not *with* him. Although goal-oriented male bonding sometimes makes projects work and new solutions merge, the predominant image of the scientist is as a solitary creator with a competitive spirit that pervades his feelings about his peers, both across the hall and across the country.

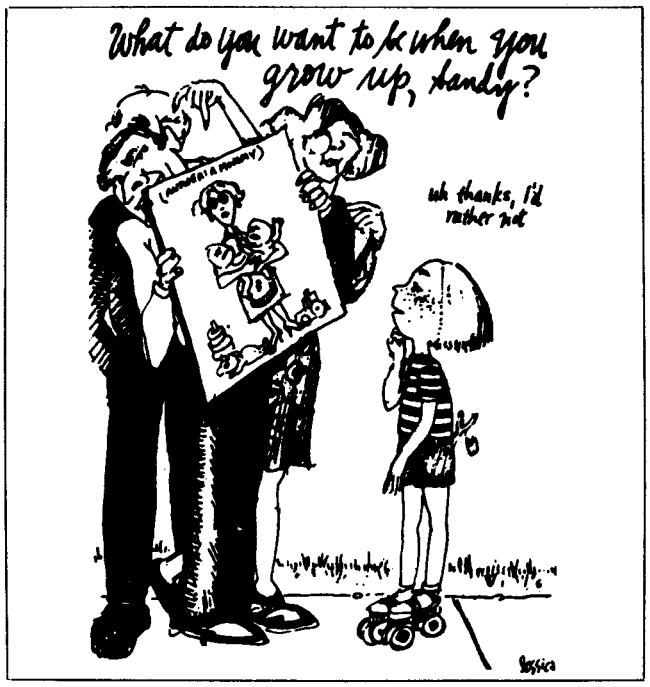
Recent feminists theory holds that the female psyche, as it is formed by the patriarchal social structure, is poorly suited to the solitary study of nature. Feminist writers in the fields of sociology (Chodorow), psychology (Dinnerstein), political theory (Flax), and philosophy of science (Keller) have argued persuasively that the personality structures of men and women have been fundamentally different since the beginning of organized patriarchal society.[1] [2] [3] [4] Nancy Chodorow, perhaps more fully than any other writer, has outlined a theory of the origins of differences in female and male psychological development and the consequences of these differences.

**Selves-in-Connection Versus Selves-in-Separation**

Chodorow begins by stating that our first and primary caretaker during infancy and early childhood is, across history and across cultures, a woman. She claims that this fact alone has enormous consequences for the psychological development of female and male human beings. That our mothers were women means that for both male and female infants our first and most important social relationship is with a female member of the species. Our earliest feelings, thoughts, and actions all occur within the context of this first relationship with a female. We experience our first emotions, ranging from intense joy to terror and despair in the presence of and at the hands of a woman.

Briefly summarized, Chodorow's thesis is that psychological development within the context of female-dominated infancy is different for male and female offspring. For males, successful emergence of an autonomous male self requires an unconscious and conscious denial of identity with this first relationship. She con-

cludes, as does Dinnerstein, that the process of separation and individuation for the male infant and child requires a denial of dependence, intimacy, deep emotional connection with others. Males emerge as "selves-in-separation", seeking psychological wholeness in autonomy, independence, solitary endeavor and competition. Being masculine entails denying everything that is female, including that part of himself that evolved in relation to his female primary caretaker.

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Chodorow argues that the psychological development of the female infant is different from the male in both process and outcome because of her first intimate relationship is with a member of her own gender. The development of self-identity and individuation does not require a girl to disavow identity with her female caretaker. She need not deny her essential connectedness and complex inter-dependence with others. Female gender identity does not necessitate denial of the first relationship or the first self. As a result, female children emerge into maturity as "selves-in-connection" with a fundamentally different sense of self and relationship to others (and perhaps nature as well) compared to their male peers.

Jane Flax argues that the different developmental processes of men and women result in distinctly different psychological orientations. For males, as selves-in-separation, the development of deep and satisfactory intimate relationships is often difficult and painful, and in many cases simply avoided. For women, as selves-in-connection, the very meaning of life revolves around intimacy. Maintaining autonomy and independence outside of human intimacy may be a continuing and painful issue throughout adult life, more so now perhaps as social change urges her to enter into the patriarchal public sphere of work. The problem of life, simply put, is the on-going struggle to balance effectively our strivings for autonomy and self-identity and our longing for intimate, nuturing and complex connections with others.

Such feminist psychological analyses, of course, fail to consider at length important political and economic matters described in socialist feminist theory. Moreover, such analyses may further polarize men and women, say their critics, since they may be used to justify limiting the options available to women. Nevertheless, Chodorow's theory especially provides a conceptual framework with which women can make sense of their experience as scientific workers. Besides offering a psychological explanation for sex-role differences that are common, if unspoken, knowledge, Chodorow tells us what we must do to eliminate these differences: we must insist on fully equal sharing of child-rearing responsibilities by both male and female parents.

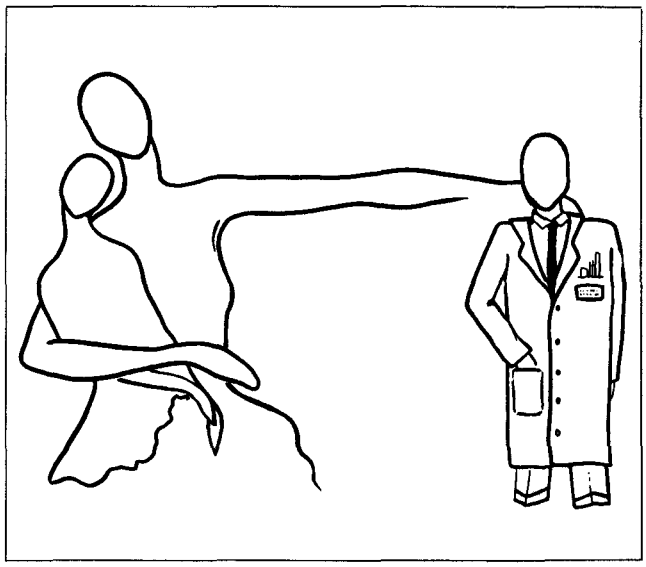
**Implications of Chodorow's Theory for Science**

Women who devote themselves to science struggle in an environment poorly structured to meet their intellectual and emotional needs. The scientific workplace was designed for and by selves-in-separation. For women, work and human connection cannot be easily or happily separated. Chodorow's analysis implies that men, as a general gender category, do not find working with women as intellectual and decision-making equals an easy task. Dinnerstein has even suggested that a too-close encounter with a true women peer and co-worker may undermine his sense of individuated power and autonomy. She has the seemingly magic power to know him deeply and force him to re-experience that dependent, engulfed aspect of self he knew in infancy when merged with his first and essential caretaker. Although such notions are difficult to verify, it seems clear that the male world of science and technology is not conducive to the intellectual, emotional or instrumental development of women. We must not be afraid to say that we are psychologically starving here.

Expecting ourselves to thrive while working alone, thinking alone and creating alone, we instead experience a disturbing immobilization, lack of personal power, and a fading sense of mission. Soon we lose the energy required to actualize our ideas or lift projects off the ground, and we search for an explanation for our feelings of defeat. Yet there seems to be no tangible impediment to accomplishment. The barriers are too long-standing, too deeply internalized and omnipresent to be

perceived. This is why feminist theory is so important; it helps us to recognize the nameless, ubiquitous nature of the patriarchal world. As Simone de Beauvoir noted, to begin to see men and their world as "the other" is the first step in the development of a feminist consciousness. To admit that one is floundering in a work environment established long ago by and for men is not dishonorable; it is the natural outcome of our capacity for relational knowledge of ourselves, others and nature itself as well as our empathy, fluid interpersonal connectedness, contextual awareness and the blurring of the distinction between object and subject.

But I grow worried as I see more and more young women, especially feminists, reject science as a foreign and inhospitable world; as something that threatens the survival of the planet. It is true that thousands of women have found the professional world of men and their mixed-sex staffs dull and empty, lacking in vitality and creative energy that derives from true collective endeavor. However, it seems hasty and unwise to walk away from the entire scientific enterprise while pointing to the many formidable social and biological problems created by that enterprise. The science created by men has accomplished much that is powerful, transformative and, sometimes, even beautiful. Science has altered our existence irrevocably, and it will continue to do so at an ever greater pace. Science has been too successful to be stopped, even if we wished to stop it. Now more than ever, women must take active responsibility for directing the course of science and managing its deleterious consequences.



**Strategies of Women Workers**

Can women thrive—or even survive—within patriarchal science? Can we accomplish anything of significance in an enterprise that often seems devoid of genuine intellectual excitement and comraderie, its talk and journals filled with disconnected trivialities?

I have observed five general strategies that women in science and other professions have pursued, consciously or not, toward their goal of working productively in the public sphere. Briefly, these five strategies are: (1) becoming an invaluable support worker in a male-dominated enterprise, (2) becoming a "supermale," (3) marrying one's mentor, (4) choosing to work in "animate" science rather than "inanimate" science, and (5) forming a science work collective. Although I believe that the formation of women's science collectives may provide the only suitable environment for the creative synthesis of feminisim and science, the prices paid in choosing other more conventional strategies need to be described.

**The Invaluable Support Worker**

The first strategy is the most common: the majority of women workers play support roles within a male-dominated enterprise. Within nearly every organization we find the irreplaceable female secretary, technician, administrative assistant, bookkeeper, or research or teaching assistant. She is the person who makes it all work, who makes certain that her male boss keeps his professional agreements, looks presentable to the public, and feels good about himself. She provides the empathy and thoughtful nurturance that, even the men will admit, makes their organization work. Such a woman often has no special academic credentials, and usually she is not well paid. She may consider her work meaningful, however, for it brings her feelings of collective accomplishment and personal worth.

Although the laboratory technician or executive secretary may feel that she plays an important role in making ideas into reality, the problem is that the ideas are nearly always men's. Men's ideas, of course, are affected by a female-dominated infancy and the values of the self-in-separation, which has denied and repressed the capacity to know intimately other human beings and nature. A woman doing support work rarely has genuine decision-making power. Her power, if she has any derives from her role as executor of men's plans; she is not truly participating in history making. Knowing that much of male-dominated enterprise is ill conceived, empty of real human meaning, and sometimes even dangerous to the survival of our species, the woman who freely chooses such a role fails to take responsibility for the future. Being an invaluable support worker means relinquishing one's power to shape the future in exchange for the satisfaction of social integration within the patriarchal work place.

**The "Super-Male"**

In nearly every work place there is a woman whose thinking and action is more masculine than men themselves. She is more hard-nosed, more enamored with rigor and self-discipline, and more eager to uphold the rules and regulations of the patriarchal institution in which she is usually a token. She learned early how to play and win the power game within her profession.

We can only guess what psychological history might lie behind such adult behavior. Perhaps girls, like boys, sometimes seek escape from engulfing intimacy in infancy and childhood. Their struggle for isolation and mastery over people and things may lead them to deny their essential connection to others. They may find the social environment of patriarchal institutions a place to reaffirm their autonomy and escape the discomfort of intimate relationships. Such women, productive as they may be, are only perpetuating the values and hierarchical organization of patriarchal science and preventing the emergence of a feminized science.

**The Wife of Her Mentor**

Many successful women scientists now in their forties, fifties, or sixties married their male mentors, who were already established in the profession and usually older. Such a woman, when asked about her husband's role in her career, will freely admit the importance of his support and intellectual involvement in her work, which often began as *his* work. Despite the setbacks from pregnancy, infant and child care, and often primary responsibility for maintaining a household, marriage to her mentor may have been a necessary step to success in the scientific world.

The more a woman's goals and methods of inquiry derive from her husband and the patriarchal institutions in which his ideas developed, the less chance she has of helping to create a new kind of science—a science not directed at conquering and sometimes destroying nature. If it is true that our traditional child-rearing practices generate in men and women very different ways of perceiving and understanding other human beings and nature, then it follows that scientific inquiry might be very different, were women the originators and executors of their own scientific questions and ideas. We have no way of knowing how science and technology might be transformed were they directed by selves-in-connection rather than selves-in-separation, but the radical feminist vision tells us that women have the potential to perceive and understand in ways that are as yet unknown. It is unlikely that the old but still powerful notion of man as conqueror of nature—as isolated, dispassionate manipulator of his mechanistic world —would be so fundamental to scientific enterprise were science in the relational hands of women.

**The "Soft" Scientist**

One could reasonably conclude from Chodorow's work that for fundamental psychological reasons inanimate science, the science of things, is less likely to fascinate women and attract their intellectual commitment than animate science. It is relatively easy for a woman, scientist or not, to become fascinated with problems of the human realm. When one tries to name prominent contemporary female scientists, the names Margaret Mead, Karen Horney, Anna Freud and Jane Goodall come to mind first. It is no accident that listing prominent women in psychology, anthropology, or sociology is far easier than listing those in elementary particle physics or radioastronomy, for the psychological orientation of most women is poorly suited to the study of small, invisible objects or large, distant ones, especially when several levels of machinery and computation mediate between the scientist and the phenomenon under study. Whereas, many thoughtful scientists have begun to understand that complete control over that which is studied, as well as objective separation of subject and object is neither logically nor, in practice, possible, the scientific establishment continues to teach that scientific understanding is equivalent to control. If the scientist can control all the variables affecting a phenomenon, he/she has succeeded, it is said, in understanding the phenomenon. The climate and paradigms of the hard sciences are alien to most women, while providing a comfortable home for selves-in-separation. It may be that the paradigms which generate fast paced scientific activity within these fields, because they derive from male psychology, are unable to captivate the woman who sees in the paradigm only half-truths.

***Although we should celebrate the partial feminization of the "soft" sciences, it is with alarm that I watch women limiting themselves to these, especially now, as it becomes more and more apparent that serious human problems can result from swift technological advances in the male-dominated "hard" sciences.***

Although we should celebrate the partial feminization of the "soft" sciences, it is with alarm that I watch women limiting themselves to these, especially now, as it becomes more and more apparent that serious human problems can result from swift technological advances in the male-dominated "hard" sciences. These are the most dangerous sciences; it is here that we need women the most.

**The Science Collective**

Attracting more women into the harder sciences will require more than affirmative action in national searches, "leniency" in tenure decisions, or a greater number of scholarships for women. As long as our


*Lynn Roberson*

child-rearing practices remain unchanged, and science is defined by men who have experienced a female-dominated infancy, women will need to construct their own scientific world and define their own scientific goals. The formation of women's scientific collectives may be a viable solution until that time when both infancy and science are freed from the constraints of psychological genderization.

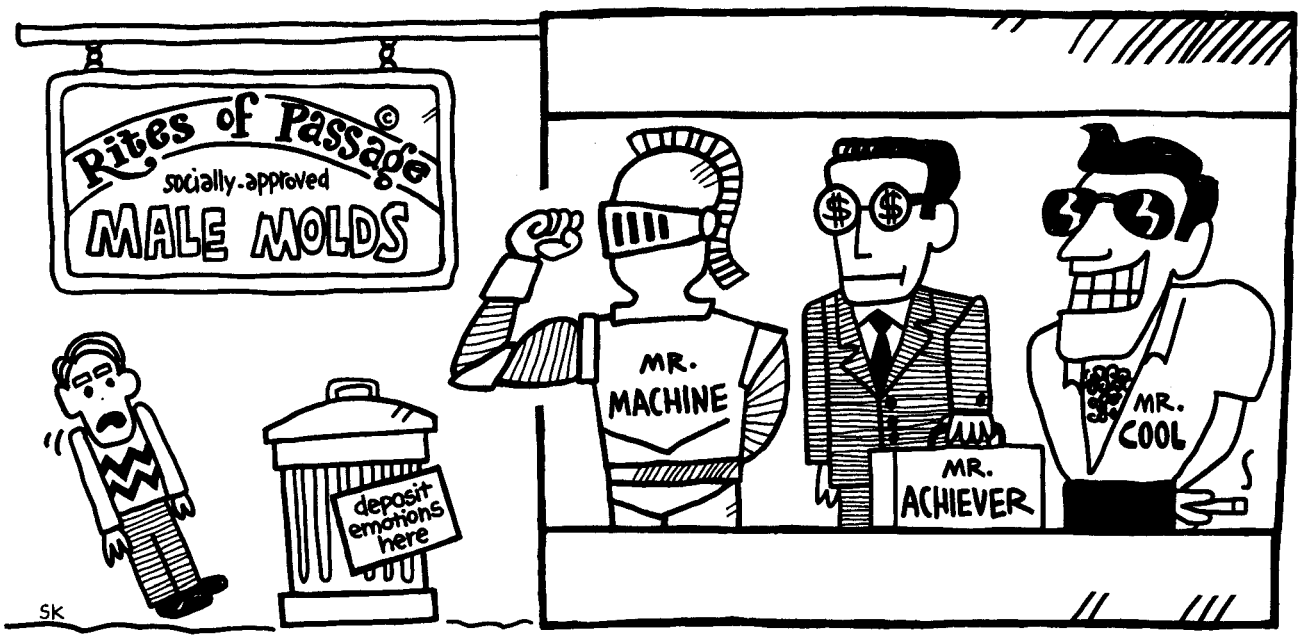
The women's movement has given birth to a variety of women's work collectives: art collectives, legal, music and therapy collectives. These organizations have been established within a feminist framework and exist to provide more humanized services to clients as well as a special work environment for its working members. Women writers, artists and musicians are creating their own publishing houses, galleries and production studios. Women's collectives are transforming the very nature of the enterprise and purpose for which they were formed. Women's music, art and human services seem qualitatively different from their traditional counterparts. Health care is holistically oriented, emphasizing prevention and personal responsibility for the functioning of one's own body. Legal services are designed to inform others of their legal rights and to teach women to use and change the legal system, without victimization.

Women's work collectives share in common an explicit recognition, even celebration, of women as selves-in-connection. They strive to generate a work environment that women need to be creative and productive. The collective process of decision-making is viewed as important as the decisions themselves. Power, work and responsibility are shared. The power hierarchy so characteristic of male organizations is opposed and often erased. The profit and competition motives are conspicuously absent. Collectives exist to provide human services and cultural beauty to people who cannot afford the arrogant prices of traditional, and often anti-female, legal, medical or psychological help. They derive from a fundamentally different psychological orientation. Working towards a set of goals for an interconnected and relational public sphere means cooperation, equal distribution of power and responsibility, and personal empowerment, not mastery, control, reductionism and competition.

Women collaborating as peers pay special attention to the details of their decision-making and executing process. In so doing, they have discovered better ways to get things done. The goals of the collective are under constant scrutiny; revised and finely modulated by an ever-changing world and by the consequences of their own work. The effects of the psychological milieu provided by the the collective on the well-being and productivity of each member is closely monitored and in the process we have discovered new ways for people to think and act together.

Many difficulties face each collective and economic survival is often in question. However, during the next decades the formation of women's work collectives may be the best strategy for providing for oneself and other women a social environment in which women can truly work, can accomplish goals for the public sphere and take active responsibility for the course of social evolution. There is no area of human life needing more desperately the energy and wisdom of women than science and technology—the very symbols of masculine endeavor and, increasingly, that part of the culture having the greatest impact on every level of human existence.

Male scientific organizations require enormous amounts of federal, state and private financial support for their operation. Millions of dollars are needed to provide the technical engineering and instrumentation that lies at the foundation of the physical and natural sciences. Most male laboratories are composed of more than scientists; specialists in electronics, computers and mechanical engineering are necessary. The scientific en-




Steve Karian

terprise is unequalled in its dependence on coordinated individual effort. Yet cooperation and collectivism of ideas and material resources are rarely apparent. To women, especially feminists, it is an alien world which contradicts, ignores or ridicules the female self-identity and mode of being.

The electronics engineer may be vital to the sucess of a project, but rarely is he/she involved in the evolution of the ideas and theories from which the project originates. He/she may be ignorant of the scientific field or conceptual focus of the experiments for which he/she builds his/her circuits. The computer programmer may be concerned only with the writing of the most efficient program to execute a task designated by the "chief" of the laboratory. The technician may analyze tissue samples, but be ignorant or disinterested in the questions being asked of that tissue. This is seen by many well-established scientists as the way to do science. The more personnel under one, the more federal money financing the work, the more successful he/she seems. It has even been argued that the coordination of data produced by psychologically and intellectually separate individuals guarantees "blind" objectivity.

The formation of a women's science collective might be one of the most exciting and important of social experiments. Such a strategy may give rise to new questions, new paradigms, new ways of knowing and the chance to explore the meaning of feminist science. However, even if we could conceive of collectivized science created out of a feminist vision, the technical and economic obstacles are great. Neither the creation nor the survival of other forms of women's work collectives have been so critically linked to technology and large scale economic support. Mobilized social and economic support from feminists and the scientific community will be necessary for such a social experiment to succeed.

While some of the products and consequences of science threaten our very existence, we cannot forget that science has proven itself to be one of the finest paths to deeper human understanding, to the extension of our perceptual experience across time and space, and to the enrichment of the quality of our lives. Such a powerful tool is too useful and too powerful to be left solely in the hands of female-raised males. Neither should we, as women, deny our special relational capacities in order to do science. We must find new ways to preserve and utilize ourselves while working toward the expansion of scientific knowledge and responsible control of technology. We can no longer be satisfied with merely a support role nor a life of quiet desperation within male enterprise. During the last decades of this century we must take it upon ourselves to try to create women's science collectives. □

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## Teachers Organize

# ASBESTOS IN THE CLASSROOM

### by Nancy Zimmet

Mesothelioma is a relatively rare form of lung cancer associated with exposure to even low levels of asbestos. No symptoms appear until fifteen to forty years after the victim first breathes asbestos; only then will mesothelioma show up on a lung x-ray. No cure or treatment exists: by the time cancer appears, the patient has less than one year to live.

In 1972 neither teachers nor staff at Newton North High School had heard about mosthelioma. Today they know a great deal about it. They were exposed to asbestos the first time they walked into the still unfinished high school in June 1972. For the next ten years they were exposed to low levels of asbestos whenever they entered the building. Theirs is the story of a struggle that lasted from 1972 to 1981—a struggle of a few parents, teachers, and students to force the city to take action—and of the city's opposition at each step of the way. It is the story of teachers learning that education alone will not bring change.

In 1972 contractors used standard construction techniques to build a new high school in Newton, Massachusetts, an upper-middle class suburb of Boston. Standard procedures included the spraying of asbestos on all internal support structures. Used as a fire retardant in the United States since World War II, asbestos is now in approximately 15% of the 1,500 Massachusetts schools inspected by the Massachusetts Special Legislative Commission on Asbestos in the late 1970s.

At Newton North, not all of the asbestos remained on the steel beams. As teacher Justine Kent-Uritam testified to the Newton Board of Aldermen in 1973, much of it lay in chunks on floors, on furniture, and on top of lockers. Over the few years following the initial spraying the asbestos dried out as its dust further contaminated the air within the building.

Teachers organized the Asbestos Removal Task Force in 1973, and students and their parents joined. Membership turned over rapidly, however, students graduated and parents left when they no longer had to worry about their own children. A small group of teachers made up the nucleus.

I joined the Asbestos Removal Task Force in 1976 after a year of teaching at Newton North. Intrigued and troubled by the asbestos controversy, no one had told me about asbestos when I interviewed for the job or when I began teaching. At a faculty meeting one afternoon however, a colleague asked what was being done about the asbestos. No one could answer her questions, but the principal went into great detail explaining why we should not be concerned. His elaborate protest was my first clue to the danger.

The federal government stepped cautiously. In August 1978, Secretary of Health, Education, and Welfare (HEW) Joseph Califano wrote to all state governors warning that "any exposure probably carries some risk of disease." The Environmental Protection Agency (EPA) established guidelines for asbestos cleanup.

Workers in business and public offices began looking at their own ceilings. In 1981 file clerks at the John Hancock Mutual Life Insurance Company in Boston asked Nine to Five, the organization for women workers, for help regarding an office filled with asbestos. In one busy area asbestos lay in chunks on the floor and on filing cabinets. Nine to Five helped clerks plan a demonstration press conference outside the John Hancock building. Without glancing at the EPA's guidelines for cleanup, the company ordered their maintenance men to simply sweep up the asbestos, according to Elaine Taber of Nine to Five.

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*Nancy Zimmet has been an English teacher at Newton North High School in Newton Massachusetts for seven years. She worked with other teachers, parents, and students to remove asbestos from the high school.*

**Asbestos Dangers Get National Coverage**

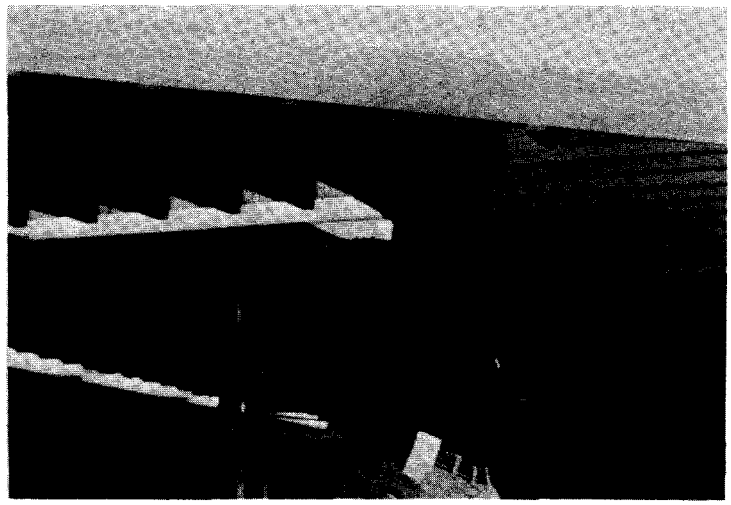
The task force was relatively inactive during the school years 1975-1976 and 1977-1978. The faculty was busy dealing with the heating and ventilating system, which had never worked properly. National awareness of the dangers of asbestos increased greatly during these years, however. As teachers at Newton North followed struggles similar to their own across the country, they thought about new strategies.

In the 1970s, U.S. newspapers documented the rising number of deaths, the rising number of suits, and the rising evidence of a cover-up of asbestos dangers by its manufacturers. The dangers were discovered much earlier but they were being publicized for the first time.

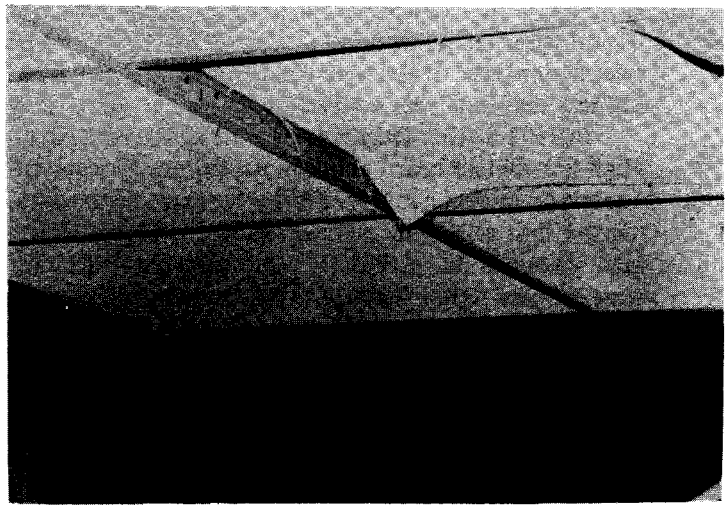
In 1971, before Newton had even sprayed the first beam, one parent in Howell Township, New Jersey, demanded that the local school board close its schools until all asbestos was removed. When other parents joined him by threatening to boycott the schools, the board closed the schools for four weeks and spent $180,000 to remove the asbestos. The parents' fight in Howell Township was the first of many. Throughout the seventies parents, teachers and students in New York City, in Allen, Pennsylvania, in Hartford and New Haven, Connecticut, and in Martha's Vineyard, Massachusetts fought successfully for asbestos removal.

In the early years the task force tried to teach the community about the dangers of asbestos by holding seminars and bringing in national experts. City officials responded, however, only by arranging to have an unreliable air test performed in the school building. In 1974 the task force brought in William Nicholson, an expert on asbestos from the Mount Sinai School of Medicine, who recommended that the exposed areas be covered without delay. "Damage to the exposed fireproofing material can occur at any time and would give rise to significant asbestos air concentrations not detected in a short-term sampling program." He had found asbestos —large chunks of it—on floors and fixtures, in storage areas and in the gym. In one area, a magazine storage room in the library, he found what he described as "the worst example of this type of pollution I have ever seen; I would never work in there!" In spite of Nicholson's warning, the board refused to appropriate money to enclose the exposed asbestos.

The connection between success and action rather than education became clear from the start. On November 13, 1974, frustrated with official inaction, students wearing face masks marched on city hall. Newspaper and television news reporters marched with them. On November 21, 1974, Newton aldermen appropriated $90,000 to begin boxing in the asbestos. When reporters left, the aldermen dropped the issue. On March 29, 1975, four months after the march and the aldermen's initial commitment to remove the asbestos, no reporters covered their meeting, no television cameras recorded their posturing. The aldermen, now claiming that the asbestos posed no health hazard, voted down a second request for $80,000. Some of the asbestos was boxed in with the 1974 appropriation, but much remained.

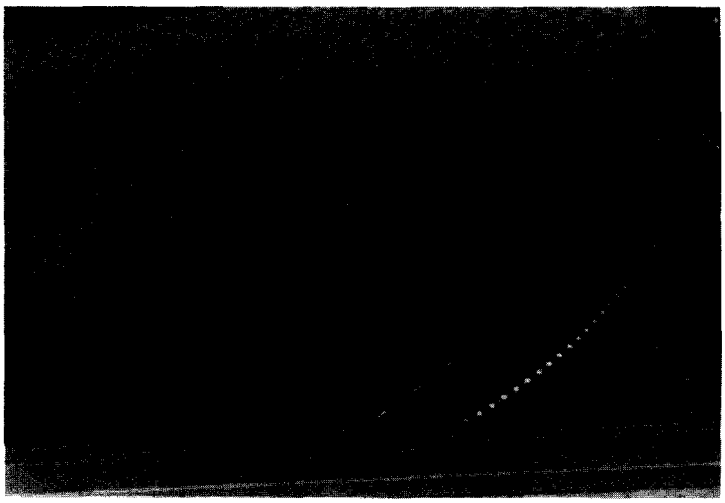


*A worker fixing the ceiling in Newton North High School. Notice that he is not wearing any protective garments.*



*A typical ceiling with loose panels in Newton North High School. Broken panels like this one contributed to the release of asbestos fibers.*

While people who worked in asbestos-filled rooms in the seventies fought for removal, people who had worked in asbestos-filled rooms in the forties and fifties, whose lives had been ruined by asbestosis and lung cancer, fought for restitution. In May, 1979 Gloria Zwerdling, a former school teacher, filed a suit for $2.5 million in Manhattan Supreme Court against 14 corporations, claiming she had contracted lung cancer



*A close-up of asbestos coating the pipes in the ceiling at Newton North High School.*

from asbestos insulation in schools. By 1979 more than a thousand lawsuits, with claims totalling over $2 billion, had been filed against manufacturers of asbestos. During the various court hearings attorneys showed documents indicating that asbestos manufacturers such as Johns-Mansville and Raybestos had known the dangers of asbestos since the 1930s.[1]

Newton City officials read newspapers during the seventies. They watched television. And yet, like Johns-Mansville, they did not act until the Task Force organized in Newton and fought for asbestos removal there.

**A Disgusting Issue**

In the late 1970s no one at Newton North wanted to organize. There was nothing exciting or fun about cleaning up asbestos. As English teacher Stan Bornstein said, "This is a disgusting issue. A nice issue would be saving whales or bringing an alternative program to the school. If you succeed at them you can see people smile. But this issue is disgusting because if you win you are going to cost some people a lot of money. If you win people will turn around and say, the place looks the same to me. I didn't see the problem in the first place." Although he tried to avoid the problem as long as he could, Bornstein eventually concluded the task force had to renew its work. Previously, he said, "you could be in your room and it was in another room and you could isolate yourself. But after a few years it was apparent that it wasn't a matter of specific space. It was the entire school...exposure was not in your own control."

In 1978 Bornstein, Lynne Rossman, another English teacher, and I began to reorganize the task force, at first ignoring the lessons of the early seventies. We too thought knowledge would make the difference: if officials only understood the problem they would immediately act on it. We sent innumerable memos, gave lectures, and attended board of aldermen meetings to explain the Massachusetts Special Legislative Commission's recommendations that Newton North remove or box in its asbestos immediately. It seemed to us that the board refused to act simply because members did not understand the theoretical basis for the commission's advice. A year later, we were still trying to make them understand. We thought the words of a world renowned expert on asbestos would have an impact.

In 1979 we encouraged city officials to attend a lecture by Irving Selikoff at the Massachusetts Institute of Technology. Head of the public health department at Mount Sinai School of Medicine and one of the country's leading experts on asbestos-related diseases, Selikoff made the same recommendation that his colleague Nicholson had made years before: "When an institution can identify asbestos, it should be removed, because there is no safe level of exposure." He agreed with Nicholson's appraisal of air testing as unreliable because "what was low one day might be high another." Furthermore, he said, any amount of asbestos is dangerous. "You don't need much of a carcinogenic to get cancer. . . . With even low levels of exposure, because there can be such a long latency period, the young are particularly susceptible. That is why it is so important that in places like Newton North the asbestos be removed." Only one member of the board of aldermen was listening, however, and there was no official reaction to Selikoff's recommendations.

Representatives from Newton's health department, the Newton building commissioner, and the city's director of support services all urged the school committee not to adopt the recommendations of the Massachusetts Special Legislative Commission. The cost to box in or remove the asbestos, in excess of $500,000, was unjustified, they claimed. The school committee agreed and voted to continue testing the air bimonthly.

Their rationale for inaction was the result of a phase contrast microscope test, which had failed to detect asbestos fibers in the air at Newton North High. Such a test is inadequate, according to Charles Spooner, an environmental scientist in Bedford, Massachusetts. It relies on a technique that is "totally inappropriate for identifying the relatively large fiber bundles in bulk samples because the identification is based on shape and size of fibers alone and on no other property. . . . Moreover, the possibility is always present that the air samples simply failed to pick up the low number of

fibers one would expect in the interior of a school." A much more accurate technique for estimating low levels of asbestos makes use of the polarized light microscope. Spooner points out that such a test, in addition to being accurate, is rapid and sufficiently inexpensive for surveying purposes."[2]

**The Task Force Goes Into Action**

Our tactics had to change, we realized at last. Education would never be enough; a more public course of action was necessary. First, we convinced the board of aldermen to hire Dr. Spooner, who, we believed, would give an honest and thorough report on the extent of the asbestos problem. Second, we publicized the report.

Pressuring members of the Newton Board of Aldermen to hire Spooner did not take great numbers; it took organization and persistence. Before any board meeting in which we knew asbestos or Spooner's hiring would be discussed, we would hold our own meetings to plan a strategy and assign tasks. Members of the Parent-Teacher-Student Association (PTSA), which generally supported our efforts, would plan to bring up the issue at their next meeting. We would talk over our plans with Newton North's principal, who often spoke at school committee and board meetings. We would write letters to the editors of local papers, and we would make certain each board member received a personal call from one of us. We would designate one of our group to make a statement, and others to ask questions designed to raise important issues. When we wanted to pack the hall, we would call everyone on our telephone tree and each task force member would call or bring others.

When we first suggested to the board that it enlist Spooner's help we were yelled at. During one meeting in 1979, Alderman Robert Stiller said he did not want an expert coming in unless it could be proven beforehand and without doubt that students and teachers would get cancer from the asbestos in the building. He questioned whether there was any danger at all from asbestos. "What would happen if I stood in a closet with a bag of asbestos over my head? Can you prove I would get cancer?" And he suggested that discontented teachers should look elsewhere for jobs. "A lot of anxiety was shown, a lot of fear has been evidenced and yet . . . they have not availed themselves of the opportunities of requesting transfers to other schools."

Stiller postured, but undaunted we packed meetings with parents, teachers, students, and increasing numbers of reporters. Despite Stiller's protests, the board hired Spooner. In his report of December, 1979, Spooner stated, as others had before, that the asbestos should be removed. The friable material was "clearly a source of asbestos fiber" in the air, he said. Furthermore, there had been "considerable deterioration of the asbestos containing material due to maintenance or vandalism."[3] He recommended that removal in three stages begin in the summer of 1980, when the school would be closed.

As teachers we still could not resist educating, but this time we would educate with the entire city watching. We took Spooner's report to the press. Then we scheduled a public meeting for February 5th. Early in January we began planning for the event: we needed a large audience, media coverage, and a panel that would attract both. We advertised in local and Boston newspapers, and the PTSA announced the event in their meetings and newsletter. Dozens of posters covered

*Pour/LNS*

school walls. Nearly everyone in the school wore a button reading "Remove Asbestos." We sent personal invitations to faculty members, the mayor, the school comittee, and the board of aldermen. During the last week in January we mailed press releases to local and Boston papers and to radio and television stations; we followed them up with phone calls.

In addition to Spooner, our panel included representatives of the Harvard School of Public Health, the EPA, the National Advisory Commission on Asbestos, and the Massachusetts Special Legislative Commission. Members of the audience repeatedly voiced their concern about future legal recourse for students, teachers, and staff. Michael Baram, a Boston attorney specializing in environmental cases and a member of the National Advisory Commission on Asbestos, talked about possibilities. The refusal of the school systems "to respond adequately to the problem will result in

nuisance, negligence, strict liability suits and a variety of creative legal actions that can be brought, as well as people seeking court orders to enjoin continued operations of schools." Newspaper, radio, and television reporters recorded every question from troubled parents.

Two weeks later, the board of aldermen appropriated $800,000 for the first phase of asbestos removal, to begin the following summer. After a delay of eight years, one-third of the asbestos was removed in the summer of 1980.

In the spring of 1981 when we asked about plans for the second phase, first we were ignored, and then we were told the city had no money to continue the project. We thought we would have to gear up for another full-scale publicity event. To our amazement, however, simply letting the mayor and the board know the task force was still alive brought an immediate change of plans. We made a few calls, wrote a few letters, and the mayor somehow found money to continue. In the summers of 1981 and 1982, Newton completed the asbestos removal.

**Get Organized and Take Power**

In spite of our eventual successes, the years of organizing were not easy. As Bornstien explains, organizing did not always foster pleasant relations with colleagues. "As soon as you make somebody aware of asbestos you are going to tap into the main line of their fears and their insecurities. The person who believes that this is an issue is going to get a little scared or maybe a lot scared. . . . I like being liked by people. I don't want, when I walk down the hall, for anyone to think, he's the one who scares me. I don't want to be the source of fear in that building."

Rossman, too, felt her colleagues were cutting her off, and she resented this reaction. "I'm really, I think, angry. I think I'm harboring a lot of anger and frustration at the lack of support from our faculty, and from administrators, and from the city, and from parents. Maybe that's the way anything works, any kind of lobbying or any political movement . . . Maybe it's always a small vanguard of people that have to do all the work."

Most people at Newton North did not join the Task Force, did not raise their voices to officials, did not fight at all. They went about their daily lives as if teaching were their only concern. On the surface, at least, they appeared unconcerned about asbestos. That was not the case. As I talked with colleagues I found that fears were pervasive and, occasionally, overwhelming. Bobbi Black, a counselor, told me how she panicked one day: "I remember the time I brought in this beautiful hanging plant. I put a hook over the ceiling panels. As I lifted a panel all of this stuff fell out. I immediately got a sore throat. I had this vision that, oh, that's all asbestos I've just ingested. I really got ill, both physically and psychologically. That was the first year in the building. I still think about that."

My colleagues' failure to join the struggle, then, was not due to their peace of mind. They remained aloof for the same reason they work at Newton North: they take the concept of professionalism seriously. No matter what happens at school—no matter how many fire drills interrupt classes, how many after-school meetings are held, how many students are put in each class, or how many classes a teacher must teach—they hold themselves responsible for the quality of education their students receive. The teachers at Newton North are there because they have been able to hold fine classes under all sorts of pressures. Asbestos was just one more problem for each to deal with alone. This time, though, none were successful. This time no individual could solve the problem.

The extent of each person's involvement with the task force became a touchstone by which almost all teachers judged themselves. John Harris, who had not become involved, was painfully honest. "I didn't get involved because of inertia and cynicism. And now I feel stupid and selfish."

Those of us who had been active in the task force only felt positive about ourselves and our work. We had improved the condition of the building; we had proven the power of organization; and some of us had become different human beings. Rossman told me "I think being aware of the asbestos and working for removal has changed me as a person. I've put myself in situations that eight years ago I would never have envisioned being involved in—speaking in front of the Board of Aldermen—I'm much more political."

We were never a large organization, nor were we politically sophisticated. But we fought at a time of growing national awareness of asbestos and the health problems it causes. When we finally understood that learning technical details and teaching them to others was only a beginning, we used political pressure. We spent our evenings and weekends organizing supporters. Success came, most of all because of our dogged persistence over ten years. □

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2. Charles Spooner, "Asbestos in Schools—A Public Health Problem," *New England Journal of Medicine*, October 4, 1979, pp. 782-783.

3. *Ibid.*

# NATURE, NATIVES, AND TECHNOLOGY

## An Interview with Winona LaDuke

Winona LaDuke is an Anishinaabe, in English, known as a Chippewa or Ojibwe Indian who works with a number of native and environmental organizations. A Radcliffe graduate, she currently lives on the White Earth Reservation in Northern Minnesota, where she is working for an end to acid rain, for clean water, and for the secession of the North American wild-rice bowl, which is the Anishinaabe treaty area. She talked with *Science for the People* about the problems uranium mining has caused native peoples.

**SftP:** In what ways does uranium mining affect native peoples ?
**LaDuke:** Let's start with an example. In 1952, the Anaconda Company discovered uranium at the village of Paguate on the Laguna Pueblo Reservation. Two decades later, Anaconda held claim to the largest uranium strip mine operating in the world. The Jackpile Mine provided the people of Laguna Pueblo with a healthy tribal treasury and much-needed employment. Then, in 1981, when the mining cycle inevitably turned from boom to bust, the Anaconda Company decided its job—along with the jobs of the Laguna—was finished. With the closure of the Jackpile Mine, the Laguna people face some stark problems, which, unlike their benefactor, the Anaconda Company, won't disappear.

In 1973, the Environmental Protection Agency (EPA) came to visit the Laguna Pueblo and found that the Rio Paguate River was contaminated with radiation from the Jackpile Mine, as was most of the groundwater near the village of Paguate. During a second visit in 1975, the EPA found that, not only in Laguna Pueblo, but throughout the entire mining region of the Southwest the groundwater was heavily contaminated with radiation.

In 1978, when EPA officials returned for the last time, they determined that several of the buildings at the Pueblo were contaminated with radiation. The community center, the Jackpile Housing Project, and the tribal council headquarters had all been constructed with radioactive materials from the mine.

Because of the groundwater contamination, the drinking fountain at a nearby rest stop on highway I-40 has been fitted with a special water purifier, which removes particles of radionuclides. Visitors, people passing through, don't have to worry about contamination, but the nontransient populations of Acoma, Laguna, and Dine (Navajo) Indians aren't so lucky.

A young Acoma Indian, Manuel Pino, expressed his fears about radiation after one of the Acoma grandmothers died from bladder cancer. Most of the Acomas live to be almost a hundred but she died young. The only thing that could have caused it, he believed was the water—the radioactive water. It takes the old and the young first. In the past two years, other Acoma grandmothers had died, apparently from the same cause. "Their water is the same water," he said, "the water that comes from that mine and those other mines west of the reservation. Uranium is a killer."

**SftP:** How does the water become contaminated? By a slow process of rain leaching radioactive materials from tailing dumps?
**LaDuke:** That's part of the problem, but there have also been major accidents at the uranium milling plants. The United Nuclear Company's Churchrock accident, which followed Three Mile Island by four months, occurred when an impoundment dam busted open. One hundred million gallons of highly radioactive water and 1,100 tons of mill tailings were immediately released into the Rio Puerco River, near Grants, New Mexico. The company had known that the dam was faulty; it had cracked two years prior to the break.

The Dine community of Churchrock was immediately affected by the spill. Animals became so contaminated with radiation that their internal organs completely deteriorated. Since the Dine depended on the animals, particularly the sheep, for their subsistence, their supply of food as well as water was eliminated. Young children were brought to Los Alamos for radiation counts, but the studies were conducted inappropriately and inadequately. Disaster relief was nonexistent until the Kerr-McGee Company finally agreed to haul in water from its Grants headquarters.

Despite the fact that it was the worst spill of radioactive materials in U.S. history, the Churchrock accident received minimal press coverage. Perhaps the press and Kerr-McGee thought that, because the accident occurred in an area of low population, where radiation levels were already quite high, it was really not news. If the same spill had happened in a wealthy white community, the media might have responded differently.

But there's irony there: because so little public attention focused on the United Nuclear Company's Churchrock "booboo," no one bothered to follow the flow of water from the Rio Puerco into the Little Colorado River, the Colorado River, and finally Lake Mead—which is a source of water for the mostly white, urban population living west of Las Vegas.

**SftP:** Presumably, Grants isn't the only area where Native Americans have to drink contaminated water.

No, not at all. On the Pine Ridge Sioux Reservation in South Dakota, there's serious contamination. Federal maximum acceptable radiation dosages are two picocuries per liter of water. Several areas of Pine Ridge average between 19 and 25 picocuries per liter.

In December of 1979, 38% of all pregnancies on Pine Ridge resulted in miscarriages before the fifth month, or excessive hemorrhaging, and 60%-70% of the children who were born suffered breathing problems caused by underdeveloped lungs and jaundice. Francis Wise, a young Indian lawyer who works with women on the reservation, decided that they had to do something about it.

The women of Pine Ridge began door-to-door surveys and scientific investigations of their environment. In March of 1980, Women of All Red Nations (WARN), an organization based in the area, released a preliminary study. The WARN study indicated that the reservation water contained pollutants from virtually every imaginable source. A major source was the two hundred-gallon spillage of uranium wastes from an abandoned mill in the nearby town of Edgemont, combined with the runoff from carcinogenic defoliants used in the area. To complicate matters, Ellsworth Air Force Base, which uses one-eighth of the reservation land as a bombing range, was contributing its share of pollutants, all of which were flowing into the water the people drink.

Subsequent investigations and a series of Freedom of Information Act (FOIA) requests verified what WARN feared. Indian Health Service records obtained through the FOIA revealed that between 1971-1979, 314 babies had been born with birth defects in a total population of 12,500 Indians.

**SftP:** You've given some specific examples of how uranium mining has affected native peoples. Could you give us an idea of the scope of the problem nationwide or globally?

**LaDuke:** The major uranium deposits under production in the world today are in North America, and the U.S. and Canada are the two leading producers; most of the deposits are in Saskatchewan, Ontario, New Mexico, and Wyoming. Other major producers are South Africa and Namibia, followed by Australia.

Without exception, uranium is located on the remaining land base of the indigenous people of these areas; and, without exception, these people—either as uranium miners or as the settled population—are getting the hell radiated out of them.

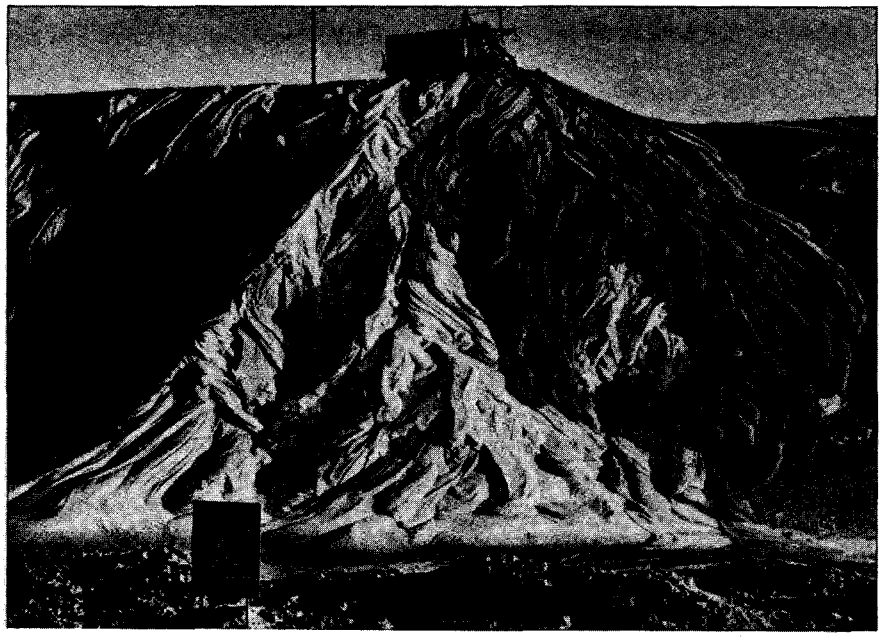
Two-thirds of all North American uranium is located on or adjacent to Indian reservations. In aborginial Australia, the figures are the same. Millions of acres of Canadian reserves are under lease for mining exploration. In 1976 alone, more than 30,000 mineral claims were staked on these reserves, primarily for uranium.

Without this context, radiation poisoning is fast becoming the main food of native peoples. And—in the name of economic and military security —control, occupation, and guns are the butter on the bread of oppression required to maintain uranium production. In Namibia, for example, South Africa maintains 70,000 government troops. Part of their job is to ensure—in defiance of U.N. sanctions—that uranium continues to be mined there. In North America, too, police forces in the form of FBI or Bureau of Indian Affairs SWAT teams are periodically brought in to protect uranium deposits and reinforce security at the mines.

**SftP:** Would you say, then, that uranium mining is a major cause of the oppression of native peoples?

**LaDuke:** Uranium itself is not what downpresses native peoples. If that were the case, the downpression would be restricted both in area and in time—to the nuclear era. The downpression of native people is linked to the subjugation and exploitation of the Earth. With each subsequent generation, the techno-industrial system creates demands for more resources from the land. First it was land for agricultural crops, then for gold, then for iron, then for oil, and now uranium.

Because the native people, or land-based, nonurban population, is closest to the Earth, its fate is directly related



Mark Lennihan

*A pile of uranium tailings in Grants, New Mexico.*

to the fate of the Earth—much more so than for an urban population which has buffered itself by means of a need-production-supply chain and a set of technological accoutrements to meet immediate physical demands.

An event like a blackout, which both causes and adversely affects the technological basis of urban, industrial society, may be regarded as an environmental crisis in urban and suburban America: for a moment, technology seems an enemy to consumers of techno-culture, but soon the lights are back on. For a native land-based population, in contrast, an environmental crisis is the flooding of one-hundred thousand square miles of northern Quebec Indian reserves for a hydroelectric project that keeps the lights bright in New York City. There's a big difference.

**SftP:** You have spoken of the "downpression" of native peoples. Is there a particular reason why you chose that term?
**LaDuke:** I use the word downpression instead of oppression because it makes the concept I wish to express very clear. Downpression means to keep down, to force the people to live on their knees rather than stand free. *Oppression* doesn't convey this meaning so directly.

**SftP:** Has this downpression of native peoples been going on long?
**LaDuke:** There has been a clear historical pattern to the subjugation of native peoples, which, like the subjugation of the natural environment, is at least four hundred years old in this hemisphere. It is even older in Europe. What the church and state have done in the Western Hemisphere has clear historical origins in the behavior of the same institutions in Europe. In both hemispheres, the exploitation of native peoples has expanded geometrically, not linearly. The industrial system has opened one mine, destroyed the ecological balance of one area, and moved onto another area: nothing is cleaned up in this system, and so the effects are cumulative, just like the effects of radiation toxins. Briefly, the subjugation, exploitation, and genocide of native peoples is structural, or systemic, in the development of the world.

**SftP:** This view of the development process has clear applications to the Third World, doesn't it?
**LaDuke:** To native peoples, there is no such thing as the first, second, and third worlds; there is only an exploiting world—whether its technological system is capitalist or communist—and a host world. Native peoples, who are more numerous and occupy more land, make up the hosts.

Water, land, and life are basic to the natural order. All else has been created by the use and misuse of technology. It is only natural that, in our respective struggles for survival, the native peoples are waging a war to protect the land, the water, and life, while the consumer culture strives to protect its technological lifeblood.

This protective pattern of response can be seen in Euro-American communities confronting the current crisis in the disposal of toxic and hazardous waste. For the most part, they focus on containing, regulating, or controlling this insidious pollution, rather than on eliminating the problem at its source. The same is true of those who propose scrubbers as a solution to acid rain. The possibility of doing away with the industry and the technology altogether is not even considered.

The aboriginal peoples of Australia illustrate the conflict between technology and the natural world succinctly, by asking, "What will you do when the clever men destroy your water?" That, in truth, is what the world is coming to.

**SftP:** Have you anything to say about the coverage of Native American issues in the press?
**LaDuke:** It's terrible. The desecration of the planet and of native peoples is hidden away in the back pages of the newspapers. Because the natural environment is not economically influential, politically prestigious, or fashionable, what happens to it cannot percolate into the information bank of the general population. The same can be said of the people who live closest to the natural environment—the native people. Native people have not attracted enough popular interest to be accorded a piece of the popular mind.

For example, the brutal struggle for a free trade union movement in Bolivia receives no press coverage by the U.S. Media Inc., liberal or not, while Poland is in the world's eye. And on the subject of the MX missile system—while nuclear-arms proliferation and the gross financial obesity of the Defense Department receive massive amounts of mental and media attention, the residents of Nevada—the Shoshone Indians—and their struggle against the MX remain invisible. And if white America has long been guilt-ridden because of a recurring "Indian problem," white America is also guilt-ridden because of a recurring environmental problem. The white American system—and finally, white America itself—relate to both of these problems in the same way: by ignoring them. As far as the crises of water contamination, radiation, and death to the natural world and its children are concerned, "respectable racism" is as alive today as it was a century ago.

**SftP:** Could you say some more about this racism?
**LaDuke:** Simply, a certain level of racism and ignorance has gained acceptance—in fact, respectability. Like the wealthy, who think of blacks only as house servants and believe they are doing these people a favor by providing them with a clean job in a good family, the consumers of technoculture relate to the native and the environment in terms of master, servant, and house. We either pick your bananas or act as a mascot for your football team. In this way, respectable, enlightened people are racist. They are arrogant toward all of nature, arrogant toward the children of nature, and ultimately arrogant toward all of life.

The point is that Euro-Americans perceive the development of their culture as a mastery of the natural world, a prime example of the progress from primitive to civilized society. They seem to believe that this culture is either immune to ecological disasters, or clever enough to survive them. This is racism, founded on the precarious conception of the technological and

# It Was That Indian

## by Simon Ortiz

Martinez
from over by Bluewater
was the one who discovered uranium
west of Grants.
That's what they said.
He brought that green stone
into town one afternoon in 1953,
said he found it by the railroad tracks
over by Haystack Butte.
Tourist magazines did a couple spreads
on him, photographed him in kodak color,
and the Chamber of Commerce celebrated
that Navajo man,
forgot for the time being
that the brothers
from Aacqu east of Grants
had killed that state patrolman,
and never mind also
that the city had a jail full of Indians.
The city fathers named
a city park after him
and some even wanted to put up a statue
of Martinez but others said
that was going too far for just an Indian
even if he was the one who started that area
into a boom.

Well, later on,
when some folks began to complain
about chemical poisons flowing into the streams
from the processing mills, carwrecks on
Highway 53,
lack of housing in Grants,
cave-ins at Section 33,
non-union support,
high cost of living,
and uranium radiation causing cancer,
they—the Chamber of Commerce— pointed out
that it was Martinez
that Navajo Indian from over by Bluewater
who discovered uranium,
it says so in this here brochure,
he found that green stone over by Haystack
out behind his hogan;
it was that Indian who started that boom.



mental superiority of the consumer-producer system.

**SftP:** We seem to have moved a long way from our starting point, which was the impact of the uranium industry on native peoples.

**LaDuke:** Not at all. Racism, oppression, and death are integral components of the resource development process, and they are all contained within the mining, milling, and technological use of uranium. Uranium represents the latest face-off between the technological world and the natural world.

That's why natural people watch with dismay as concern about uranium mining in the general population steadily diminishes, and the issue of nuclear power fizzles out as the issue of nuclear weaponry grows. Perhaps people respond to issues in the way described by Don Morton, a white political exile from South Africa: "We get so caught up in the scientific minutiae about 'nukes' and related fields," he said, "that sometimes we lose sight of the fundamental problem. If we could win the struggle to keep uranium in the ground, then we would have indeed sliced off the head of the nuclear industry *and* weapons threat."

**SftP:** Do you think it's possible to win that struggle?

**LaDuke:** Well, if we are to listen to U.S. economists, either progressive or conservative, the uranium mining industry is going bust. All of the big plans for mining expansion look like the delirious hallucinations of gluttons who ate too much. A 1979 joint report by the OECD Nuclear Energy Agency and the International Atomic Energy Agency predicted that the 368 operating mines in the U.S. would double their 1979 production levels by 1985, that Canadian production would also double; that South African production would be maintained; and that Australian production would increase twenty times by the end of the decade.

But in the last three years, the exchange value of uranium has dropped rapidly, from $43.25 per pound in late 1978 to $23 recently. The crash in the price of uranium has precipitated a halt to innumerable mining ventures around the globe and


*Peg Averill/LNS*

forced a number of mines across the United States to close. In the Grants mineral belt alone, Kerr-McGee has mothballed its Rio Puerco mine; Phillips Corporation has done the same for a large mining project; and United Nuclear (which, rumor has it, may be getting into fast foods) has closed three mines. Needless to say, all the experts in the nuclear industry look a little bit stupid.

Unfortunately, one would have to be even more delirious than the gluttonous uranium/nuclear industry to believe that, if the mines close down, the problems will simply disappear. The mountains that have been turned into molehills by the uranium industry are still as radioactive as they were five years ago. All of these sites, and the water that flows from them, will continue to leak radiation so long as the contamination is not contained.

The symptoms of the problem—nuclear power and weapons—won't disappear either. If the industry doesn't have enough uranium now to make the planet totally uninhabitable, it can always use those precious strategic stockpiles of ore, or reopen the mines and start all over again.

So when the people who live in the Grants mineral belt and elsewhere in uranium country see the mines close down, they say, "They'll come back again. They always come back for more." They remember that, before the uranium, it was coal, before that, it was oil, gold, copper, and silver.

There is a critical difference between the native's mentality and the visitor's mentality, that is, the mentality of industry. The visitor moves from resource to resource, from mine to mine, from factory to factory, assaulting the Earth and the Earth's people, and leaving behind skeletons. The native, nontransient population has no option to move or to evacuate. As Corbin Harney, tribal elder of the Shoshone Indian Duck Valley Reservation said, "If we do not have the land, we have nowhere else to go. . . . How can we lose something that is part of us, something that is tied to our lives?"

**SftP:** Looking to the future, do you see growing resistance by native peoples?

**LaDuke:** Of course. The native has no choice but to act in defense of the native community and the natural environment. And episode after episode of native people's resistance to technoculture permeates the nuclear era. On May 29, 1980, a group of Ketchi Indians went to the mayor at Panzos, Guatemala, insisting that their land be returned to them. The Guatemalan army was waiting, and opened fire: three hundred natives were massacred. The incident was much like the massacre of three hundred Indians at Wounded Knee a century before. It is the same war.

In the Black Hills of South Dakota, a group of Lakota or Sioux have liberated an area of their sacred lands from government ownership. In April 1980, the Lakota began to resettle in the hills, in an effort to establish a self-sufficient community. Their peaceful encampment, called Yellow Thunder Camp, has met with military surveillance, terrorism, and harassment. The governor of South Dakota, William Janklow, has accelerated an aggressive anti-Indian campaign, but the group remains undaunted.

The land war in North America continues; but, perhaps because it is close, so real, and so disguised by the collective racism, downpression, and callousness of the American consumer, it is not noticed by most.

Resources are the staple which nourish the military-industrial-technological system, and perpetrate its expansion. The native sees that the system may drift and change, but it must always come back to the land for its food. That means it must come back to land-based peoples. For that reason, the system and the native have always been, and will always be, enemies. □

For ongoing coverage of Native issues, we recommend:
Akwasasne Notes
Mohawk Nation
Roosevelt, NY 13683
Subscriptions are $6/yr.

In the book *Voices from Wounded Knee, 1973,* participants tell the story of the Wounded Knee occupation. It is available from *Akwasasne Notes* for $6.95

For more information about Indian struggles against resource development, contact:
The Black Hills Alliance
P.O. Box 2508
Rapid City, SD 57709

The International Indian Treaty Council
777 United Nations Plaza
New York, NY 10017

For more information about Indian oppression, particularly as pertains to political prisoners, we recommend a two-part series which appeared in *New Age Magazine,* November 1980 and January 1981, called, "The Story of Leonard Peltier and a Culture Under Siege". Write to:
New Age
PO Box 1200
Allston, MA 02143

# book review

by Larry Goldsmith

## Sexual Preference: Its Development in Men and Women

**by Alan P. Bell, Martin S. Weinberg, and Susan Kiefer Hammersmith, Indiana University Press, Indiana, 2 Volumes, 1981, $40.**

It was not until the late nineteenth century that scientists invented the homosexual. That is not to say there were no sexual acts between persons of the same gender prior to that time. But the idea of homosexuals and heterosexuals as two identifiable and mutually exclusive types of human being first surfaced in Germany as a popular reaction to a proposed law forbidding homosexual acts between men. Given this new category of human existence, it remained only for a certain Dr. Benkert, writing in 1869, to coin an appropriate term—*homosexuality*.

Ever since that time, doctors, lawyers, psychologists, and scientists have given their best efforts to answering the question: *Why* are there homosexuals? They have poked and probed, interrogated and incarcerated, synthesized and analyzed, castrated and lobotomized—all in an effort to understand the origins of this troublesome "condition." But, curiously, in that time the question *"What* is a homosexual?" has only rarely been posed and has never satisfactorily been answered.

In a recent report entitled *Sexual Preference: Its Development in Men and Women,* researchers at the Alfred C. Kinsey Institute for Sex Research again ask the first question and ignore the second. To test the importance of various childhood experiences in causing homosexuality, Alan P. Bell, Martin S. Weinberg, and Sue Kiefer Hammersmith questioned self-identified homosexuals and heterosexuals and compared the responses of the two groups.

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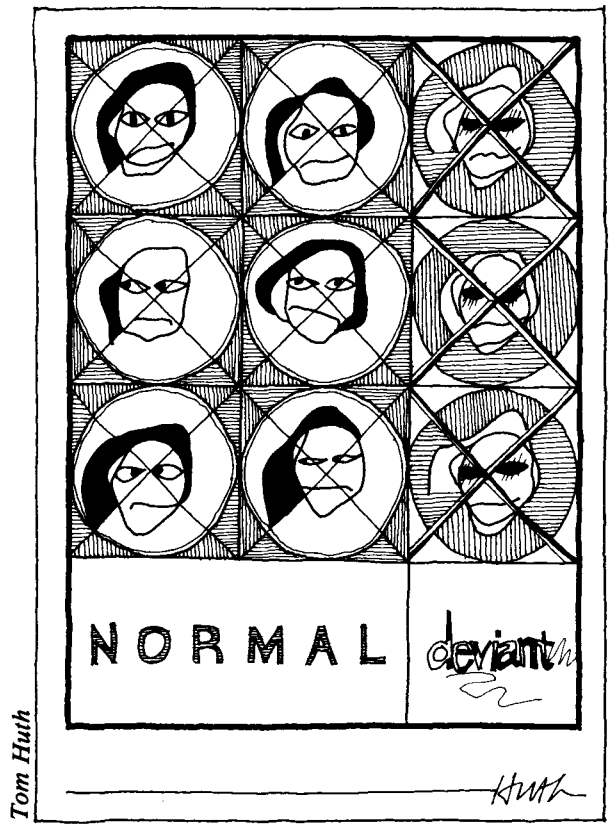
*Larry Goldsmith is a staff reporter for* Gay Community News. *An earlier version of this review was published in* Gay Community News.

**Sexuality Defies Categories**

Too many people begin by assuming that there are two types of people in the world: homosexuals and heterosexuals. Of course, not all homosexual behavior is limited to those people we call homosexuals, and not all of those people labeled homosexual behave consistently as homosexuals. We can account for this incongruity by revising our categories in one of two ways. Those who fit clearly into neither category might make up some sort of special case (we might call them bisexual or asexual, for example). Or the conditions under which we observed candidates for classification might be "unfair" ("He was drunk," "It's just a phase," or "That's a normal outlet in boarding school" might serve to excuse them.)

Rather than face the embarrassment of explaining so many exceptions to our two categories, we might simply increase the number of classifications. We might allot a greater legitimacy to categories such as bisexual, or we might opt, as did the late Dr. Kinsey, for a whole spectrum of sexual orientations ("You're a 6, but I'm only a 4."). Yet not even Kinsey's valiant attempt at quantification can alter the fact that human sexuality, like all human experience, defies quantifica-



tion, delimitation, or comprehensive objective description.

The French philosopher Guy Hocquenghem, in his book *Homosexual Desire,* characterizes sexuality as a "polyvocal flux of desire." Desire, for Hocquenghem, cannot be broken into components; any categorization of sexuality as, for instance, "homosexual desire" or "heterosexual desire" is but an "arbitrarily frozen frame" of the flux. In short, because of the complex and ineluctable nature of human sexuality, any attempt at definition will necessarily be incomplete.

**Social Control**

Our insistence upon forcing sexuality into categories too narrow to accommodate our experience means that we are forever denying aspects of that experience. When we say "He's not *really* a homosexual, he was just drunk" (or, "He was just fooling around") we deny the homosexual component of a person's sexuality in exactly the same way as when we say "She *must* be a homosexual—she once had sex with another woman."

With such deliberate self-deception —through so-called objective description of human experience—science serves as a form of social control. By providing us with the artificial yet well-defined conditions of homosexual and heterosexual, psychologists and sociologists draw a clear line between what is normal and what is deviant. A move in the direction of deviancy means either that a person acted under special circumstances or that the person is a full-fledged deviant. The distinctness of the line which must be crossed is a strong deterrent to the person contemplating the visit into deviancy. And the strict segregation enforced by such thinking not only helps to keep most people "normal," it serves also to keep the "deviant" fixed in her or his place.*

Scientists and laypersons alike tend to view the study of sexuality as merely an objective rendering of human behavioral patterns. They often fail to recognize that the very identification of a condition—the step that takes us from individual human behavior to pathology—imposes constraints on behavior. Legislation and psychiatric opinion create real limitations on appropriate behavior by adopting standards of criminality and legality or sickness and health. In adopting a teleological approach to the study of homosexuality, the authors of *Sexual Preference* disingenuously open the door to direct scientific control of individual sexuality.

**The Great Debate**

Ironically, the view of homosexuality as a pathological condition, either biological or developing in the first few years of childhood, has long been a source of comfort to those who call themselves homosexuals. Dr. Benkert, along with Magnus Hirschfeld and other leaders of the homosexual emancipation movement in Germany, argued that homosexuality could not be prohibited by law because it was merely a matter of individual biology. The *Reichstag* might just as well move to ban diabetes and epilepsy, too. Freud and his followers later shifted the focus from biology to early childhood experience, blaming the parents of the homosexual for the homosexual's condition.

The debate over the cause of homosexuality has centered on the question of whether biology or society is to blame. Is Nature at fault? A well-known chemist recently took me to task for worrying about the politics of sexuality. "It's all a matter of hormones," he told me in earnest. "The research is moving fast and it won't be long before we can control these things, once and for all." Or is Nurture the problem? Careful, parents. Not so strong Mom. A little closer Dad.

Now a psychotherapist and two sociologists from the Kinsey Institute have added new coal to the fire. Using a statistical method called path analysis on data based on the childhood social and sexual behavior of 979 male and female homosexuals and 477 male and female heterosexuals, Bell, Weinberg, and Hammersmith offer a consolation to guilty parents that earned front page attention in the *New York Times:*

For the benefit of readers who are concerned about what parents may do to influence (or whether they are responsible for) their children's sexual preference, we would restate our findings another way. No particular phenomenon of family life can be

## PATH ANALYSIS & MULTIPLE REGRESSION

*Multiple regression* is a statistical procedure intended to measure the effect of a group of independent variables $X_1, \ldots, Xp$, on a single other dependent variable, Y, and to test whether there is such an effect. In order to perform such a test, one must make assumptions about the nature of the relationship (that it is linear) and the nature of the distribution of the variation (or error) in Y for given values of $X_1, \ldots, Xp$ (that it is "bell-shaped").

*Path Analysis,* a way of performing a collection of multiple regressions in a highly structured manner, is commonly used by sociologists and political scientists in the analysis of data from surveys. In order to do path analysis, one specifies the possible causal relationships among the variables before examining the date; e.g., C is influenced by A and B; E is influenced by A and C; and F by A, B, and D. Then one estimates the magnitude of these influences and tests whether they are sufficiently large (compared to the variability in the data) to be considered real. These tests are based on the same kind of assumptions about the nature of the variables being studied as in regression.

Statistical procedures may be thought of as measuring devices that work well on particular kinds of material and not so well on others; they therefore must be applied thoughtfully (one wouldn't use a microscope to look at the stars). However, even when applied appropriately, these methods cannot usually be regarded as definitive when applied to surveys. Conclusions drawn from them must be tentative, since these methods can do little more than suggest relationships or the lack thereof in social science data.

*An excellent account of these phenomena is given by Mary McIntosh in "The Homosexual Role," *Social Problems,* vol. XVI, no.2, Autumn 1968, p. 182.

> singled out, on the basis of our findings, as especially consequential for either homosexual or heterosexual development. You may supply your sons with footballs and your daughters with dolls, but no one can guarantee that they will enjoy them. What we seem to have identified—given that our model applies only to extant theories and does not create new ones—is a pattern of feelings and reactions within the child that cannot be traced back to a single social or psychological root; indeed, homosexuality may arise from a biological precursor (as do left-handedness and allergies, for example) that parents cannot control. In short, to concerned parents we cannot recommend any thing beyong the care, sympathy, and devotion that good parents presumably lavish on all their children anyway.
> 95

The authors take care not to exceed the limitations of their method. Because path analysis can be used only to test existing notions, not to propose new hypotheses, the researchers cannot investigate possible biological pathways to homosexuality. But they can—and do—rule out nearly all of what must be an exhaustive array of social and psychological influences. The strongest factors remaining are "childhood gender non-conformity" and homosexual activities in childhood and adolescence. These factors are not *causes* of homosexuality, however; they merely reflect what seems to be an already deep-seated predisposition to homosexuality.

It is by a curious process of elimination, then, that the authors advance their suggestion that "homosexuality may derive from a biological precursor." Their research furnishes no argument for a biological cause of homosexuality save the indirect evidence that all conceivable non-biological causes seem improbable. Throughout their analysis of social and psychological causes, however, the authors intimate that biology is to blame. Their final chapter, headed with the overt query "Biology?", presents no evidence of a biological cause.

Why, then, after discarding the erroneous psychological and sociological explanations of the past, do the authors settle for the equally troublesome theory of a "biological precursor"? Ingenuous as it seems, their suggestive conclusion belies a deterministic view of sexuality that offers free reign to those, who, like my acquaintance the chemist, would use science to control such behavior.

It is almost tempting to criticize this study on its merits and flaws as scientific research. The relatively large size of their sample, which was gathered from beyond the usual collection of homosexuals in therapy or institutions, and the undoubtedly sincere attempt to use innovative and "objective" analytical techniques might all merit praise. However, the age of the data (a lot has happened to change homosexuals' perceptions of themselves since 1969-70, when the interviews were conducted), the reliance on individual memories of childhood for hard data, and the sample distribution (all interviewees lived in the San Francisco Bay Area; most homosexual subjects were recruited through bars, organizations, and advertisements in movement newspapers) all detract from the validity of the conclusions.

But these are all secondary considerations. There is no need to worry about these details when we should be worrying about asking the wrong question. The question is not, *Why* are there homosexuals? but rather, *What* is a homosexual?□

## Circle Most Correct Answer a homo- I am a bi- sexual a hetero-

**by Craig Roberts**

As a human being, I have the capacity to love. As a member of this society, I would be restricted in the expression of this ability. I am not a member.

Why live a life struggling with society's restrictions? Why use society's words and definitions to describe and to guide your life? The concept of love existed in man's mind long before words like homosexual and heterosexual were invented. Prior to their invention, I doubt if it was ever wrong to love somebody. There was love before there were societies and there will be love long after the last society unless we destroy ourselves with them.

The way to stop being a member of a society is to stop believing in it. When you wonder who you are and why you are existing, don't use society's definitions if you want accurate answers. Accuracy has been sacrificed for convenience. Instead, use your mirror. Use your mind. Use your own words. Our society believes all 2.5 billion people on this planet can be categorized into one of three sexual preference groups. As a non-society member, I see 2.5 billion categories. No one feels exactly as I do. Who and why I love is as unique to me as my fingerprints. I do not call myself gay, bi, or heterosexual. I call myself Craig. I believe in myself. I am my own society.

Circle Most Correct Answer:

**a homo- I am a bi-sexual a hetero-**

*—This article is reprinted with permission from* M. gentlemen for gender justice.

# book review

by Sue Tafler

## Circle of Poison

### by David Weir and Mark Schapiro, The Institute for Food and Development Policy, San Francisco, CA, 1981, $3.95.

The use of DDT, dieldrin, heptachlor, and chlordane is prohibited or heavily restricted in the United States, but these and many other pesticides are being exported today by U.S. companies to developing nations. This "dumping" of products banned in the U.S. is completely legal—and highly profitable.

According to David Weir and Mark Schapiro, "Pesticide exports create a circle of poison, disabling workers in American chemical plants and later returning to us in the food we import." In their compelling little book, *Circle of Poison*, they discuss both the hazards to illiterate farmworkers in developing countries as well as the hazards to U.S. citizens, both at the beginning of the global route of banned pesticides and at the end. The effects suffered by both chemical plant workers and farmworkers range from vomiting, weakness, and dizziness to convulsions, aplastic anemia, sterility, and birth defects. The World Health Organization (WHO) estimates that 500,000 people worldwide suffer from pesticide poisoning each year and 5,000 die.

**Inappropriate Technology**

A main premise of *Circle of Poison* is that hazardous pesticides are a case of the export of inappropriate technology. Weir and Schapiro assert that even pesticides that may be "safe," when properly used by U.S. farmers with respirators and full-body protective covering, are dangerously abused in developing countries. They describe farmworkers mixing pesticides with their hands, carrying pesticides in turbans on their heads or in unmarked Coke bottles, and using pesticide drums for drinking water.

The authors try to emphasize the commonness of the problem worldwide, they quote U.S. Environmental Protection Agency (EPA) statistics of 14,000 poisonings a year of farmworkers in the United States. Since the focus of the book is on Latin America, Africa, and Asia, however, readers may get the impression that things are okay or at least not so bad in the United States. We should note, however, the recent news of serious contamination of Hawaiian milk and dairy products by heptachlor (a potential carcinogen and known to cause liver disorders). Use of heptachlor is banned in the U.S., *with the specific exemption of Hawaii's pineapples.*[1]

Weir and Schapiro document how the pesticide technology transfer is encouraged and subsidized by the U.S. Agency for International Development, the Export-Import Bank, and the Overseas Private Investment Corporation. Other promoters of "the global pesticide supermarket" were found to be in the United Nations Food and Agriculture Organization, the international banks, and the "green revolution" agriculture research institutes.

Since most developing countries lack adequate regulatory apparatus to prevent improper use of pesticides, Weir and Schapiro point out that it is unrealistic to leave it to these countries to protect their own people (as the chemical industry has suggested). Often, they found, only one or two individuals bear the equivalent responsibility of the entire EPA, also the environmental officials in many developing countries have limited expertise to evaluate the health risks of pesticide use. Certainly, we might note, even the large EPA bureaucracy has failed to provide us with adequate protection in many cases.

**The Food We Eat**

A common rationale for sending pesticides deemed too dangerous for use in the United States to developing countries is the urgent need to provide food for hungry millions and control epidemics of insect-transmitted diseases. Weir and Schapiro do not deal with the public health issue, but they argue that such pesticides are *not* a necessary evil for averting hunger. Their investigation turned up the fact that 50 to 70 percent of the pesticides used in developing countries are applied to the luxury plantation crops exported to Europe, Japan, and the United States, not to subsistence food crops. Intense use of pesticides on export crops such as coffee, cocoa, and cotton is necessary to meet the high standards of appearance for marketing these exports (or, as Weir and Schapiro put it, the demand for the "perfect banana").

Use of pesticides on locally consumed crops has also increased, with the encouragement of local governments and development agencies. Heavy pesticide use is often associated with the introduction of "green revolution" grains. One result of the green revolution has been the worsening of rural poverty in some

*Sue Tafler is coeditor of* Feed, Need, Greed, *a high school curriculum on food, population, and resources published by Science for the People. She is currently teaching high school biology and writing free lance popular science articles.*

places, benefiting rich farmers and causing poor farmers to lose their land.

According to Weir and Schapiro, we in the United States may be consuming unsafe imported food. Because inspection procedures are slow and limited, the Food and Drug Administration (FDA) allows perishable shipments that may bear illegal pesticide residues to pass to market unchecked. Even imported foods bearing "mystery chemicals," presumably pesticides never registered in the U.S., are allowed to pass.

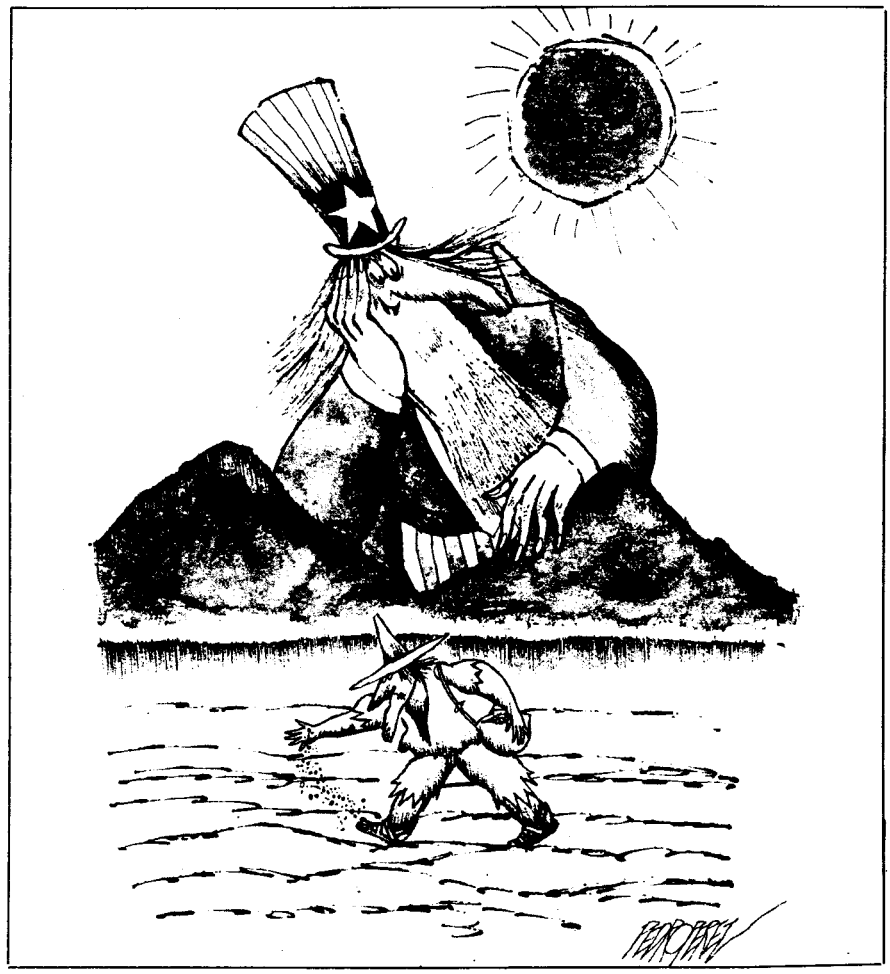
**FIFRA Lives**

The EPA is shackled in this matter, Weir and Schapiro explain. The authors assume, perhaps wrongly, that the EPA is well-intentioned. *Circle of Poison* was written, remember, before the Reagan administration and Anne Gorsuch took over the agency. Under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), the EPA's jurisdiction over the export of pesticides is essentially limited to registration; thus, the agency can place legal restrictions on domestic uses and can withdraw its formal sanction altogether by canceling registration, but it cannot stop export. *Circle of Poison* describes regulations amending FIFRA, and implemented by the EPA only in July 1980, under which exporters must notify importers of the EPA registration status upon the first shipment of the year. The effectiveness of this notification procedure is limited, however, since the local importer is often a subsidiary of the exporting pesticide firm or a multinational agribusiness corporation, not a farmer who will be using the product. Moreover, it fails to prohibit the chemical industry from shipping pesticides or their ingredients to intermediary countries from which the pesticides are re-exported free of regulation.

Hopeful that the situation can be improved by legislative reform, Weir and Schapiro urge readers to write Congressman Michael Barnes of Maryland in support of his bill to amend the Export Administration Act. The Barnes bill would prohibit the export of all hazardous goods, unless the exporter applies for a license stating that the prospective recipient country has requested the product and that the potential benefits of its use outweigh the possible hazards. The corporations involved however, may be too powerful to be severely hampered by such efforts.

Indeed, it now seems likely that the Reagan administration will kill the EPA's notification system, or at least push for amendments to limit the notification requirements to unregistered pesticides. (Even DDT and chlordane are still registered in the U.S. for certain "emergency" uses.)[2] The Reagan Administration has consistently favored "free export" of hazardous products. This was most blatantly shown by the United States' solitary vote in May 1981 against WHO limitation on the export of infant formula, and by President Reagan's repeal, shortly after he came into office, of President Carter's executive order calling for a Hazardous Substances Export Policy.

Weir and Schapiro have succeeded in stirring up the National Agricultural Chemicals Association (NACA), which has represented the whole chemical industry in its rebuttal of *Circle of Poison*. Jack Early, president of NACA, has claimed that many chemicals have been banned without justification. For example, he says DDT was used in the United Staes before its ban "without incurring a single documented case of harm or fatal injury," likewise, he claims, proposed restrictions of saccharin and nitrites go against scientific evidence. Early questions whether the United States should tell other countries, "on the basis of our affluent standards, where the appropriate balance of benefits and risks should lie for them." Who are we, he asks, to impose our value judgments on other societies?



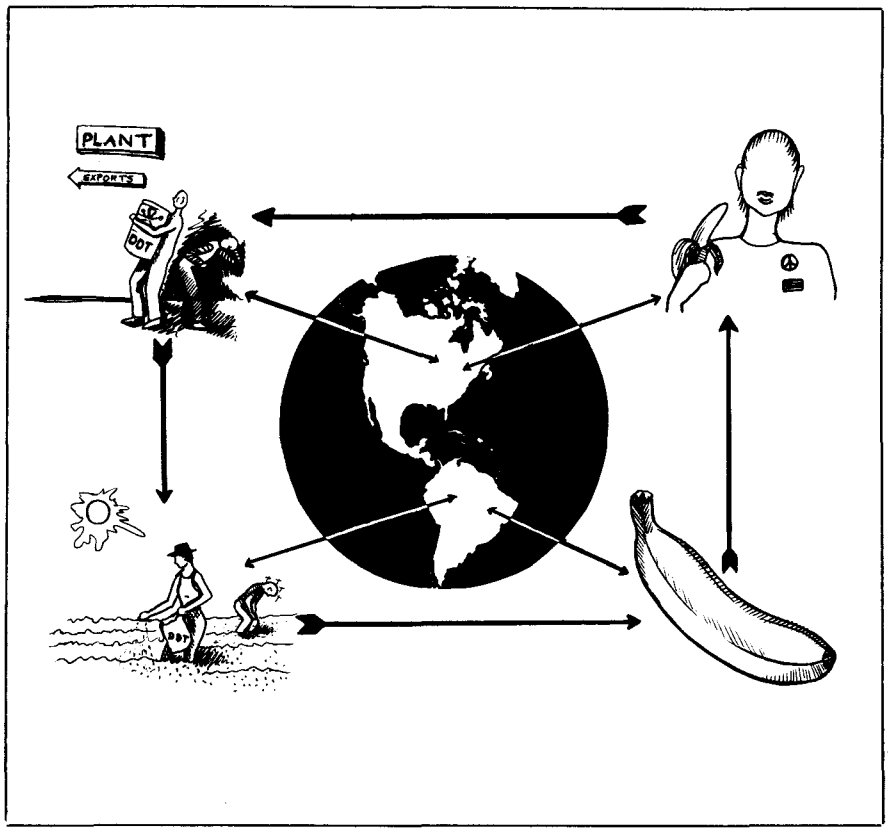
*Pedro Perez/LNS*

**What is the Solution?**

Weir and Schapiro have found the involvement of some international agencies to be a somewhat hopeful sign. The United Nations General Assembly in 1979 urged the exchange of information on hazardous chemicals and unsafe pharmaceuticals banned in the manufacturing country and discouraged export of such products to other countries. Action is underway in the U.N. Environmental Program (UNEP) to strengthen the International Register of Potentially Toxic Chemicals and facilitate access to it. The success of any international communication requires, however, the cooperation of the United States and other industrialized countries.

More encouraging, perhaps, is *Circle of Poison*'s description of how a few developing nations groups are organizing around this issue. In Malaysia, the Consumer Association of Penang has discovered pesticide residues on local crops and in drinking water and is pressuring their government to tighten regulations. The Farmer's Assistance Board, a group of peasants and students in the Philippines, has tried to blame high pesticide volume on big export producers (Castle and Cook, Del Monte). The Environmental Liaison Centre in Kenya has also been vocal.

In their last chapter, Weir and Schapiro make important points clear when they discuss how "a few executives from a handful of multinational corporations and their governmental allies are allowed to make decisions affecting entire peoples." They believe, and I agree, that the solution is to make sure that "society's important decisions—including economic decisions like the development and marketing of agricultural chemicals—are made more democratically." To this end, they conclude, "the answer is not to make the powerful more responsible, but to redistribute the power." They avoid giving any blueprint for the redistribution of power and democratization, although they recommend their readers educate themselves about economics and join an activist or public interest group (a list is provided in an appendix).




*Tana Acton*

It is important to understand that pesticides are not the only banned products exported by U.S. companies. Infant sleepwear treated with Tris (a flame retardant) was exported after Tris was found to cause cancer and banned for use in this country. Attempts were made to export Neomulsoy, an infant formula found to be lacking in crucial ions essential for infant survival. Foods containing cyclamates have been exported, as have out-of-date antibiotics.

The export of banned pesticides is, then, just one example of *caveat emptor*. The indiscriminate export of potentially hazardous materials into a global marketplace is business as usual. To stop the widespread poisoning by pesticides and other hazardous products, business-as-usual must be stopped.

The authors of *Circle of Poison*, staff writers at the Center for Investigative Reporting in Oakland, have been writing on the issue of "dumping" for several years. In writing *Circle of Poison* they interviewed extensively and studied many government and industry reports. Their book is well documented, given their difficulties in cracking the industry's trade secrets and the resistance of federal agencies to opening files.

The Institute for Food and Policy Development (IFPD), publisher of *Circle of Poison*, is led by Frances Moore Lappe and Joseph Collins. The IFPD, which has shown considerable expertise in global food policy, has field workers worldwide who contributed to *Circle of Poison*. IFPD's best known books are *Food First*, on causes of food scarcity and hunger, and *Aid as Obstacle*, on problems with U.S. food aid.* □

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## MX MISSILE

*(Continued from page 11)*

run to the civilian economy since much of the additional spending promotes domestic production in our most capital and technology-intensive sectors."[16] Clearly, Secretary Brown would have been on much firmer ground if he had made the same argument about solar energy.

Of course, a high percentage of secondary impact in the services sector might be offset by the benefits of particular services. For example, services used in housing, such as provision of utilities and plumbing, not only provide financial support but make living easier for all of us. A service such as day care can expand the available work force.

What are the services stimulated by missile expenditures? To a large extent they are professional and managerial services provided by consulting firms. Many of them, 4.9% of the total secondary output, fall under the category of "travel entertainment and gifts," and "business services." A recent study of seven leading contractors for the MX project documents over $120 million in lobbying, campaign contributions, and federally defined "questionable payments," including bribes.[17]

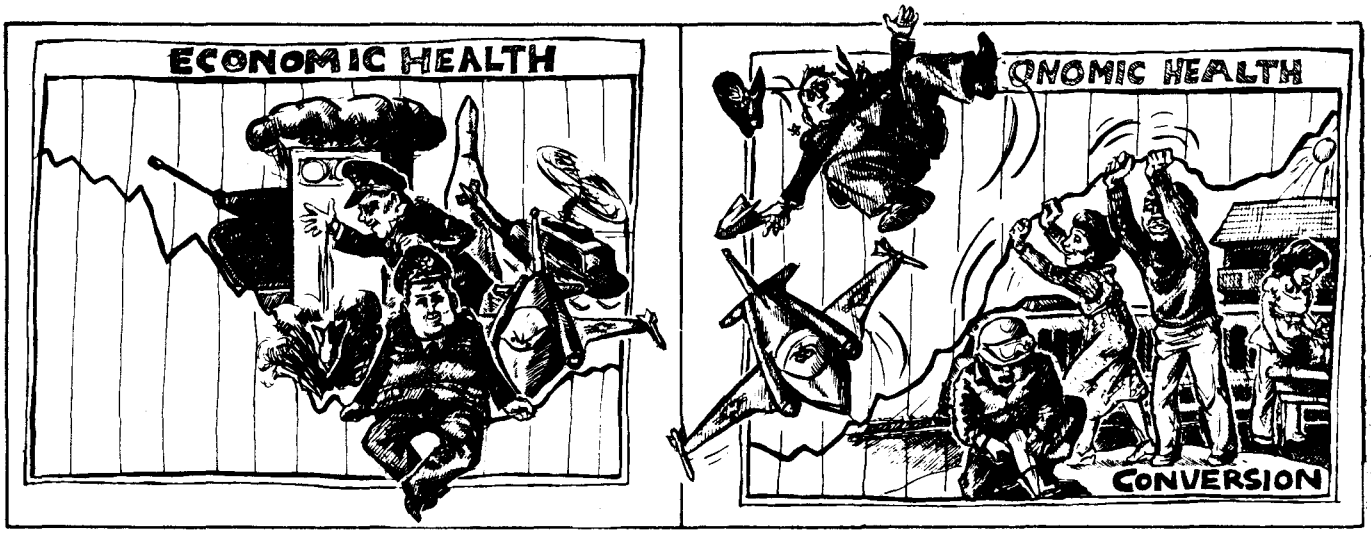
By multiplying figures in Table 1 and Table 4, we see that an expenditure for solar energy manufacture generates 2.7 times the secondary output in manufacturing as the same expenditure in missiles. Using Table 1 and Table 5 we find that solar energy is about 4.5 times as effective as missiles in generating secondary output in key industries.

### Effects of Capital Investment

We have not yet examined the effects of new capital investment—the cost of building factories when existing capacity is used up. Some capital investment has already occured in the missile and aerospace industries, thus providing needed capacity. What is the likely impact over the long run?

Arms buildups are periodic; spending cannot continue at its present level. Factories opening now, therefore, must eventually close. The devastating waste of money and resources as titanium and aerospace plants closed due to lack of demand in the aftermath of the Vietnam war demonstrated these trends. One-third to one-half of the aerospace work force was laid off within one year. The current increase in weapons production is much greater than that of the Vietnam war. Since plant capacity is nearly used up now, the new buildup will require substantial capital investment and will be followed by a similar but more severe period of shutdowns and layoffs.

We have seen that missile production stimulates comparatively little production in other industries. Every dollar of increased final demand for missiles generates less than one dollar's worth (93 cents) of secondary output. Solar energy manufacturing generates almost twice as much secondary output ($1.78). The benefits of missile production are even more meager in key industries, in which alternative programs stimulate 2 to 4.5 times more demand. Because of the current supply and labor shortages in the missile industry and the industries that supply it, even these scanty economic benefits will most likely be lessened by increased prices, shifts in the production patterns, increased reliance on imports, and a worsening in the national balance of payments.




*Workbook/cpf*

That the secondary output of missile production is comparatively minor seems unimportant, of course, when we weigh the real disadvantages of the arms race; the threat of total annihilation and an increasingly repressive police state overwhelms us. It is wise, however, not only to consider the logic of our opponents, but to begin to grasp the logic of our economy. We need to empirically trace the implications of the production of choices which are forced upon us, especially with regard to employment, income, income distribution, and use value. These choices are having an increasingly devastating effect on our society.□

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6. Conversations with and letter to the author, July 2, 7, 1980. "It is wrong, however, to add the ratio of two outputs and the ratio of two employment levels. The other terms in the 'aerospace multiplier' may be attempts to compensate for this initial error." "The Aerospace Gross Output multiplier is indeed far too high."

7. Secondary Output as used here refers to the total impact of the Leontief 'Inverse Multipliers' which are generated through Input-Output Analysis on industrial transactions. They are also referred to as Total Industrial Requirements or Direct and Indirect requirements per dollar final demand. The significance of these multipliers, as opposed to the Keynesian concept of multipliers, has been treated by P.N. Rasmussen in *Intersectoral Relations* (North Holland, 1956). "To a large extent the analysis of the Input-Output model can in fact be phrased as an analysis of production multipliers." Unlike the Keynesian multiplier which highlights the impact of consumer demand given an initial injection of either investment or government final demand, the Leontief model is far richer and economically more relevant in uncovering the factors of the differing fabricational structures of the hundreds of industries which constitute the industrial base of the economy. Using the inverse, Rasmussen developed indices of the power and dispersion implicit in the fabricational structure of the various sectors:

> This index (inverse multipliers) describes the relative extent to which an increase in final demand for the products of industry j (e.g. missiles) is dispersed throughout the system of industries ...(it) may also be explained by saying that the index expresses the extent of the expansion caused in the system of industries in general by an expansion of industry j. p. 135In effect we have compared the potential expansion caused in thesystem of industries by an increase in the final demand for missiles with that for the five alternatives.

8. U.S. Department of Labor, Bureau of Labor Statistics, Office of Economic Growth, *Historical and Projected Input-Output Tables of the Economic Growth Project, Vol. II Total Requirements Tables,* Table 3, INV1973., Bulletin 2056, February 1980.

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> Capacity shortages result in pressures—pressures to raise prices as demand outpaces capacity to supply; pressures to raise wages to keep pace with the higher prices and as the demand for labor gets closer to exceeding supply and pressure to increase investment in plant and equipment to meet these higher demands with resulting pressures in the capital market and capital goods industry. pp. 15-19.

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14. Table 4 is derived from Table 3, Bulletin 2056, op. cit.

15. "Key industries" in this particular usage indicate sectors which produce primarily capital goods for intermediate demand. Table 5, Department of Labor, Bulletin 2056, op. cit. Derived from Table 3.

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## CORRECTIONS

There were several errors in the article "Fighting Cancer and the Medical Establishment" that appeared in *SftP*, July/August 1982, Vol. 14 No. 4. On page 25 in the second column, in the first pagagraph the sentence that begins with "After a few months..." should read, "After a few weeks." On page 27 in the the third column toward the end of the second paragraph, the sentence that begins, "It turned out it wasn't..." should read, "It turned out that there was another lump and it was malignant. I had to have a lumpectomy." On page 28 in the third column the top paragraph the last sentence should read, "Another problem with the method is that it can be used to blame the victim."

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