

# SCIENCE FOR THE PEOPLE

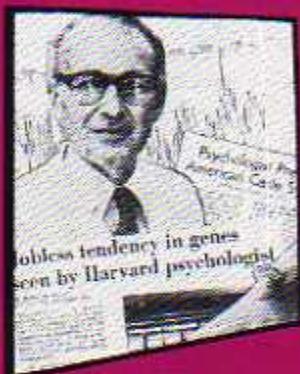
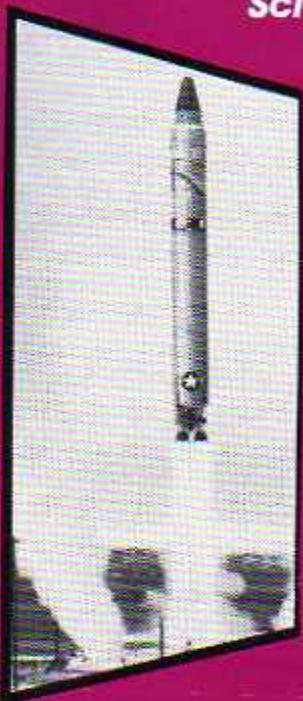
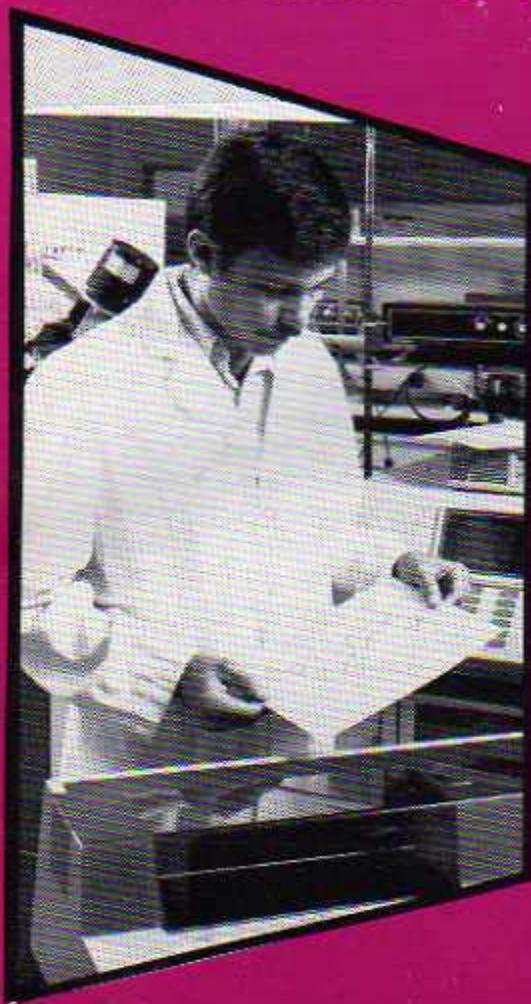
Vol. 16 No. 4

\$2.50

## SHAPING OUR IMAGE OF SCIENCE:

*A Special Issue on*

*Science, Media, and Policymaking*



# about this issue

This special issue of *SCIENCE for the PEOPLE* comes at a time of tremendous growth in science coverage by the mainstream media. In addition to the mainstay of popular science magazines, many major newspapers have added regular science sections. Science stories make up a greater portion of television and radio news items than ever before; even science-related book publishing is on the increase, as can be seen especially in the myriad of nuclear war-related books.

There is good reason for such a surge. The inescapable fact is that science plays an increasingly important role in our lives, from President Reagan's star wars military schemes, to plans to irradiate our produce. It is in many ways heartening that people are realizing the importance of such issues. But how are these issues portrayed? While people are receiving an ever larger dose of science-related material in the media, just what, in fact, are they receiving? These are some of the questions that we started with in planning for this special issue on "Science, Media and Policymaking."

From the beginning, we were interested in the ways in which science, media and policymaking fit together. It was our initial premise that the portrayal of science issues in the mainstream media is important not only in and of itself, but also for the significant role this coverage plays in shaping our notions of science, and in turn, science policymaking. The findings presented in this issue can lay the groundwork for future discussion of this much underreported topic.

David Dickson, in an excerpt from his forthcoming book, *The New Politics of Science*, outlines what he terms a "democratic strategy for science." Taking a detailed look at the forces that have shaped the major critiques of science since World War II, Dickson calls for coalition building to more effectively address the breadth of science and science policy issues which confront the left today.

With this as an overview of where to go from here, the rest of the articles deal directly with where we are now ... and why. Each looks closely at a specific area of coverage by the media. Brett Silverstein uncovers one vital area in his article *Statistical Propaganda and the Nuclear Arms Race*. Gleaning examples from mainstream sources such as *The New York Times* and *Newsweek*, Silverstein highlights the numerous ways in which statistics are manipulated.

Barbara Beckwith looks at "genes-and-gender science" coverage in her article *How Magazines Cover Sex Difference Research: Journalism Abdicates its*

*Watchdog Role*. Documenting startling cases of sensationalism and distortion, Beckwith points clearly to where many peoples' biased notions of genetic influences on behavior hail from.

In her article *Whose Health and Welfare: The Press and Occupational Health*, Chris Anne Raymond draws upon a large research project to look at the differences in the portrayal of occupational health and safety — and in fact all labor issues — between the mainstream media and the advocacy press. As might be expected, these differences run deep.

Finally, Seth Shulman, along with some members of the editorial committee, takes a brief foray into the world of popular science magazines, perhaps illuminating more than anything else what sets *Science for the People* apart.

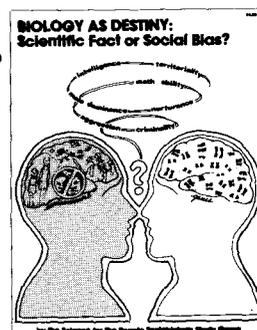
On this last point: while we have changed a great deal over the past fifteen years of our existence, certain fundamental things have solidly remained. We are still published by a *collective* with branches around the country. This loose group is made up of both concerned members of the scientific community and laypeople alike, all of whom donate their time to put out a periodical which not only looks hard and critically at the role science plays in our society, but also tries to present alternatives. These goals cannot be overstressed in a special issue on science, media and policymaking. Largely because of this solid foundation, we never, to draw upon Barbara Beckwith's title, abdicate our watchdog role, only work to sharpen our perspective.

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*Science for the People* is published bi-monthly by the Science Resource Center, Inc., a non-profit corporation. The magazine is edited and produced by the national organization Science for the People. Our address is 897 Main St., Cambridge, MA 02139; our phone number is (617) 547-0370. We offer a progressive view of science and technology, covering a broad range of issues. We welcome contributions of all kinds; articles, letters, book reviews, artwork, cartoons, news notes, etc. If possible, please type manuscripts (double spaced) and send three copies. Be sure to keep one copy for yourself. Unless otherwise stated, all material in this magazine is copyright 1984 by Science for the People. Typesetting at Platform Studio, 636 Beacon St., Boston, MA 02215. (617) 424-1497.

Bookstores may order on consignment directly from Science for the People or through Carrier Pigeon Distributors, P.O.

Box 2783, Boston, MA 02208. The magazine is available on microfilm from Xerox Microfilms, 300 North Zeeb Rd., Ann Arbor, MI 48109. *Science for the People* is indexed in *Alternative Press Index*, P.O. Box 7229, Baltimore, MD 21218. Science for the People's ISSN (International Standard Serial Number) is: 0048-9662.

Subscription rates (for one year/six issues): \$15 (regular base rate), foreign surface mail add \$5; foreign air mail subscription rates as follows, reflecting differences in mailing costs: to Canada add \$5.50, to Latin America add \$9.50, to Europe add \$13.00, to Asia/Africa add \$16.50; institutional/library rate: \$24; member subscription \$25. Member subscribers receive the magazine, our newsletter and other internal communications. Foreign subscribers must remit in \$U.S. with either an International Money Order or a check drawn on a U.S. bank.

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## Tampon Regulation at Impasse

After two years of intensive negotiations with the tampon industry, a nationwide coalition of women's health and consumer organizations has reached an impasse in their effort to draft voluntary standards for tampon manufacture and labeling. In a recent letter to Dr. Mark



Novich, acting commissioner of the Food and Drug Administration, members of the coalition cited manufacturers' continued unwillingness to disclose contents of the tampons as the major obstacle to the development of performance standards.

In 1981, because of the association of high absorbency tampons with Toxic Shock Syndrome (TSS), the FDA requested that the coalition of groups concerned with tampon safety join with the five major tampon manufacturers to develop voluntary standards. By 1982, many tampon packages displayed voluntary labels informing women of the dangers of TSS, and warning them to use the least absorbent tampons which would satisfactorily suit their needs. However, women still had no way to compare absorbency of different brands, since to standards had been set. The "super" variety of one brand might actually be less absorbent than the regular variety of another.

While media coverage of TSS seems to currently concentrate on the anomalous cases such as babies and men who develop TSS, such reporting shifts the focus of the public away from the known association of TSS with tampons. 2401 cases of TSS have been reported in 1984 alone. With two new cases of TSS reported per day, and two deaths per month, it is dangerous to allow women to forget about

the risk involved in using tampons improperly.

The tampon task force continues to meet, although many members of the coalition question how much farther they can go without the manufacturers' cooperation. The task force has urged the FDA to convene a scientific panel to propose a research agenda for the study of tampons and vaginal health, and to mandate a standard for tampon absorbency labeling. But at press time there has been no progress, and there appears no guarantee that the requests will be granted. Woman Health International urges everyone to write to the FDA to support their efforts, and ask for a scientific panel to study all effects of tampons on vaginal health. Letters should be addressed to Dr. Mark Novich, acting commissioner of the FDA, 5600 Fishers

Lane, Rockville, MD 20857. If you do send a letter, also make a copy and send it to Woman Health International, so that they may keep records of their support.

## That's Capitalism. . .

"ST. GEORGE'S, GRENADA—A U.S. firm has been awarded a contract to help complete Grenada's half-built airport at Point Salines, where Cuban laborers exchanged fire last October with U.S. and Caribbean troops. The U.S. Embassy said representatives of the U.S. Agency for International Development signed a \$2.8 million agreement last Friday with Morrison-Knudsen International, which is based in Idaho. Congress has appropriated about \$19 million of the \$24 million needed to put the airport into full-time operation by the end of October." — *Boston Globe*, 5/27/84

## Feed, Need, Greed Update

Several years ago SftP's Food and Nutrition Group published a high school curriculum called, *Feed, Need, Greed*. We have sold thousands of copies since then, with much positive response. Schools across the country have bought copies as well. But it just recently came



Nick Thorkelson

to our attention that teachers and administrators at one school, Beckett Academy in Connecticut, have really put their mouths where their money is. Not only is *Feed, Need, Greed* required reading for all students at Beckett, but for the past three years the dining hall has modified the school meal plan in accordance with recommendations from *Feed, Need, Greed*.

Joan Wolter of Beckett Academy told SftP, "we decided, thanks to the chapters on food in your text, to 'cold turkey' the sugar, salt, ketchup, and as much as possible the preservatives, cakes, etc. when school opened in the fall of 1981. To help cushion the shock, we introduced th chapters in *Feed, Need, Greed* Unit II and II to our students. We use the text in the fall each year.

"*Feed, Need, Greed* is definitely a helping tool as the explanations are concise and fun. This last is very important to students who have trouble concentrating and reading as they tend to become very bored and fidget if they cannot immediately grasp the material or be entertained. Throughout the year we try to really follow the directives of the text." Needless to say, we are heartened to hear of the work Beckett Academy has done and only wish more schools would watch more carefully what their students (and teachers) are served to eat.

A limited number of copies of *Feed, Need, Greed* are still available for \$5.00 each. Orders can be made through the national office.

### SEND US A NOTE

Send *Science for the People* news notes about science, or related areas of interest to our readers and we'll extend your subscription by six months for those items we print! Please cite your sources and/or include clippings. Send them to: Newsnotes, *Science for the People*, 897 Main St., Cambridge, MA 02139.

## Title IX Setback

The Supreme Court recently struck a major blow to everyone interested in equality for women. In *Grove City College vs. Bell*, the court reinterpreted Title IX of the Education Act so that it applies only to those specific programs that receive direct federal funding. Previously, Title IX was interpreted broadly to mandate sex equality in all programs, provided the institution received some federal funding. Even if some of the programs did not receive federal funds directly, they still had to adhere to the sex equality mandate.

Since the wording Title IX is similar to the wording in Title VI of the Civil Rights Act, Section 504 of the Rehabilitation Act, and the Age Discrimination Act of 1975, many people fear that the Grove City ruling may set a disastrous precedent for similar reinterpretations.

Although a few bills have been introduced to bring back the original interpretations, groups such as American Women in Science (AWIS), National Coalition for Women and Girls in Education (NCWGE), the Leadership Conference for Civil Rights, and a coalition of of handicapped and older persons' organizations have joined together to introduce omnibus legislation. Such a bill would enforce broad interpretations of the bills mentioned above, as well as reinstate the original interpretation of Title IX.

The coalition hopes to get the omnibus bill through Congress this session. If you'd like to help support the effort, contact the AWIS legislative alert at the AWIS national office, 1346 Connecticut Avenue, NW, Suite 1122, Washington, DC 20046.

## Preppie Genes

Amherst College has added its name to the list of establishments making presumptions about genetic influences on behavior. According to a piece published in *The Nation*, Amherst's "Interim Report of the Ad Hoc Trustee Committee on Campus Life," states that in addition to their other virtues, Amherst boasts: "a student population of the most genetically gifted... young people in America."

We at SftP would like to add our name to the list of establishments asking for more precise information about such

inherited characteristics—or preppie genes, as it were. In the words of *The Nation*, "No doubt the students came from genetically gifted boarding schools and, upon graduation from Amherst, find genetically gifted jobs in ditto professions. It doesn't take much learning to break that code." We couldn't agree more. But for some insights into just why such terms find their way into documents of this type, see Barbara Beckwith's article on media portrayal of genetic research on gender differences in this issue.

## Nicaragua Needs Science Professors

The Sandinista government of Nicaragua is making plans for the future, in spite of continuing aggression on the part of the United States. Most of their plans are bound up in overcoming the historic underdevelopment of their country, and the Sandinistas are well aware of the importance of higher education in the process of economic development. Five priority areas have been named by the Nicaraguan National Council on Higher Education (CNES): health, technology, agriculture, education (especially science teaching) and basic sciences.

Higher education has only begun to be taken seriously in Nicaragua since the Sandinista revolution. The first undergraduate programs in basic sciences were inaugurated just last year, and programs in biology and chemistry have yet to be implemented. A large proportion of scientists currently teaching in Nicaraguan universities are foreigners, and many of the rest were educated abroad. Still, there are not enough people to teach all the courses that Nicaraguan schools would like to offer. The CNES anticipates shortages of mathematics and statistics professors for 1986; these shortages will continue to grow as more classes of students enter the new programs in these subjects. Similar shortages are anticipated in other subject areas as well.

A number of North Americans have already taught in Nicaraguan univer-

sities. Until now, their visits have generally been arranged through personal contacts, on an individual basis. Members of Science for the People are now organizing an informal network of progressive scientists and solidarity activists, with the goal of simplifying and systematizing the process of educational exchange between the US and Nicaragua.

This organizing is being done in conjunction with the National Network in Solidarity with the people of Nicaragua. North American scientists who are interested in supporting the Nicaraguan revolution, and who are willing to spend 10 months (March-December) teaching their specialties in Spanish under rugged and sometimes exasperating conditions are much needed in Nicaragua.

Local chapters and individual members of SftP are urged to participate in this project. Local committees in many different parts of the country are needed to distribute information about the project and interview candidates. Any funds raised in the US to defray living expenses of North American teachers will save Nicaragua precious resources. Most importantly, information about this project needs to get out. A SftP forum on science and education in Nicaragua will both help to recruit teachers and contribute in an essential way to fighting US State Department propaganda about revolutionary Nicaragua.

People interested in participating in any way in the teaching project can contact Science for the People.

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# TOWARDS A DEMOCRATIC STRATEGY FOR SCIENCE

## The New Politics of Science

by David Dickson

**I**n the immediate postwar period, the single issue that lay heaviest on the conscience and consciousness of the scientific community was its contribution, whether explicit or implicit, to the most horrendous weapon ever conceived, developed, or used — the atomic bomb. Few challenged the escalating budget for science at the time, particularly since, coming primarily from public sources, the funds could be justified as social expenditures relatively untainted by the search for private profit. Where protest movements did spring up, as around the Atomic Scientists of Chicago, the Federation of American Scientists, and the journal *Bulletin of Atomic Scientists*, these tended to focus on the moral schizophrenia that the bomb had created within the scientific community that was projected onto broader debates about the impact of science and society.<sup>1</sup>

Accepting responsibility for creating the knowledge that had made the bomb possible, these groups tended to characterize critical political questions about science in terms of the balance between the “uses” (such as nuclear power) and the “abuses” (such as nuclear weapons) to which scientific knowledge could be put. Thus the period in which science saw rapidly increased funding, due partly to its contribution to long-term military technology, was only one in which criticism of the implications of this trend, from both within and outside the scientific community, tended to focus on ways of bringing the military uses of science under civilian control. Many of those closely involved in the Manhattan Project, for example, subsequently devoted almost equal efforts to furthering diplomatic initiatives aimed at placing controls on nuclear energy under the Atoms for Peace banner.<sup>2</sup>

In the late 1960's the focus and style of the critique shifted. The use during the Vietnam War of a wide variety of new chemical and electronic weapons, as well as scientific experts in fields that ranged from agriculture to sociology, meant that the taint of collaboration with the military was

no longer restricted to nuclear scientists, but affected virtually all disciplines of science. Furthermore, growing awareness of the environmental and occupational health problems associated with science-based industrial processes made it impossible to maintain a clear distinction between the military (i.e., “bad”) and civilian (i.e., “good”) applications of science. A new generation of critics, taking their lead from the civil rights and free speech movements in the U.S., the student revolts in Paris and elsewhere in Europe, and sharp attacks on the political uses of scientific rationality. Groups such as Science for the People demonstrated how social and political values saturate the scientific laboratory and even, in cases such as sociobiology and the claimed links between genes and social behaviour, the idea and theories claimed to belong to science itself.<sup>3</sup>

Despite the importance of both the analytical and political work carried out on such topics, however, the agenda of the radical science movement has frequently remained restricted to those issues which gave it its initial impetus in the late 1960's and early 1970's. The result was a critical approach that had much to say about the need for the control of the potential health hazards of recombinant DNA research or chemical carcinogens, but less about the increased private control of scientific knowledge resulting from changes in patent laws, attempts to use controls on the dissemination of scientific knowledge as an instrument of foreign policy and capitalist expansion, the use of scientific arguments to legitimize the molding of the regulation of technology into a form compatible with the political needs of the nation's industrial leaders, or several other key issues in what I have described as the new politics of science.

This is the task that now lies ahead. Building on the work of the two generations of earlier critics, it is now both possible and necessary to move forward to address the key political issues that are likely to be expressed through science and science policy for the remainder of the decade, if not the century. To put it schematically, the first postwar generation of science critics demonstrated the need to develop a political debate around the applications of science; the second generation shifted focus to the other end of the spectrum, namely the conditions under which science is produced. The new task is to integrate these two perspectives into a single critique of the whole spectrum, from the most fundamental science through to its most sophisti-

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*David Dickson is European correspondent for Science Magazine. This article is excerpted from his forthcoming book, The New Politics of Science, published this summer by Pantheon. He is also the author of The Politics of Alternative Technology.*

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cated high technology applications. In particular it is necessary to concentrate on ways of politicizing the discussion of the terms and conditions of access to science, the crucial intermediate position between production and application. For it is here, I suggest, that political action is now the most needed, and where the possibilities of opening science to proper democratic control are most in danger of being foreclosed.

At both the institutional and the cultural levels, the nation's industrial and academic leaders have joined forces to preach the message that the scientific method holds the key to the future international competitiveness of U.S. industry and to the decisions that will make the realization of this competitiveness possible. At the same time, however, they have moved to ensure a tightening of private control over the channels through which research results are transferred from the laboratory to the outside world. The apparent efficiency of the marketplace in achieving this is allowed to obscure the extent to which it is also steadily reinforcing the increased concentration of political power in the hands of private decision-makers. Thus, despite the fact that the application of scientific results to social uses through technology is becoming one of the biggest single issues on the contemporary political agenda, it is an issue that is steadily being removed further and further from the domain of democratic decision-making.

### **Beyond "Socially Responsible"**

The substance of a truly democratic strategy for science and science policy would be the reintegration of those needs and aspirations that are steadily being excluded from both by current trends. Within the U.S. this means not merely shifting public research priorities away from destructive ends (such as defense) toward socially constructive goals (such as health and nutrition), long the staple demands of those seeking a "socially responsible" science. Equally important, it means changing the conditions of access to the fruits of publicly funded research so that those social groups that lack the economic or political power currently required to exploit such research are placed in a position to do so. Complementary to this need, on an international level, to explore ways in which those countries most in need of the results of this same research to meet their basic requirements for food and energy can also more readily obtain access to it, without being forced to accept the political terms — namely the integration of their economies into a marketplace dominated by the advanced Western nations — on which this research is increasingly being offered.

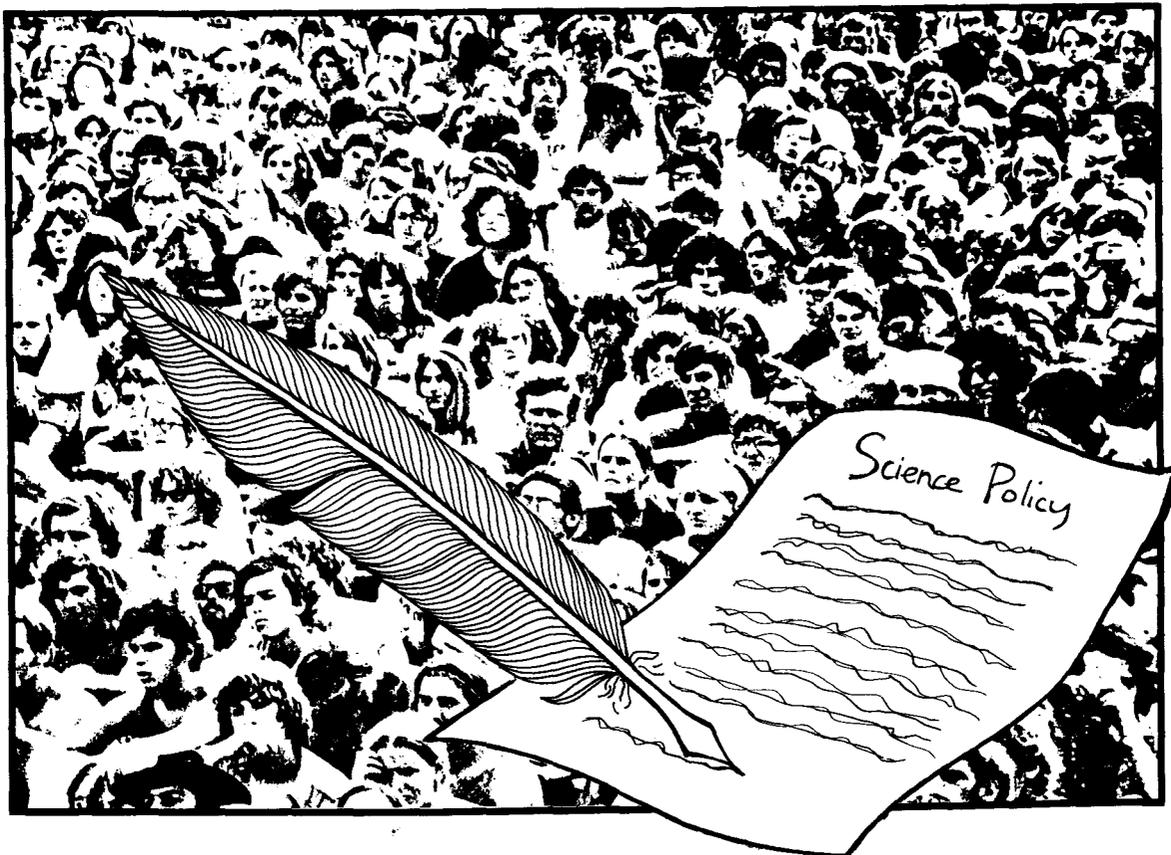
The need to democratize the practice and applications of science can be divided into three principal stages. The first concentrates on the procedures and work practices of the scientific community. Bacon's prescription for the scientific method, with its strict fragmentation of tasks and its rigid hierarchical patterns of control, still rules in the majority of scientific laboratories. One of the first goals of an alternative science policy would be to demonstrate how neither is necessary for a creative and effective research laboratory, yet how

these patterns of organization and control of research are frequently imposed as a reflection of broader political relationships that maintain the subservience of science to capital. Democratizing the laboratory does not mean the laboratory technicians, or even members of the community, should necessarily be given equal weight to principal investigators in the choice of research directions in fundamental science, or of investigative techniques. But it does mean that the criteria by which priorities and practices are decided should be open to discussion at all levels, that the chances of individual scientists being allowed to build research empires whose top priority becomes economic profitability or institutional survival are minimized, and that scientists accept the many ways in which decisions taken inside the laboratory have important social dimensions that should not be resolved behind closed doors.<sup>4</sup>

Democratizing the laboratory would be a first step toward creating a science based on new social relations and a new ideology. A second would be democratizing the institutions that decide how research funds should be allocated. Already this is being done to a limited extent. At the National Institute of Health, for example, each grant request is discussed by two committees, one a scientific committee whose role is to judge the scientific quality of the application, another a committee including nonscientists which decides whether a particular research proposal should be supported on the basis of the prior scientific evaluation as well as other criteria, such as the general availability of research funds and the importance of the research being pursued. A considerable degree of selectivity in the use of biomedical research funds is also imposed by Congress, where the desires of individual congressmen to be seen securing additional research funds into a particular highly publicized illness have generated what is widely known as the "disease-of-the-month" syndrome. The approach has several weaknesses (many of which are eagerly pointed out by scientists who would like their research funds to come with fewer strings attached, and thus emphasize how cures to a disease may come from completely unexpected areas of research.) The extent to which decisions about which diseases shall receive special research treatment are really the result of democratic choices, rather than a vehicle for raising conscience money from the wealthy to be spent on their terms, is also debatable. Nevertheless, as Representative Henry Waxman argued in the summer of 1983 in suggesting that Congress should play a greater role in determining the detailed research programs of the NIH (a suggestion strongly opposed by virtually the whole biomedical research community), the procedures for more direct input into the selection of research priorities exists in embryo form, with enough examples of successful intervention to justify this approach.<sup>5</sup>

At the other end of the spectrum is the need to develop ways of democratizing technological innovation. To give an example, in the middle of the 1970's, workers at the Lucas Aerospace

*(next page)*



Keith McHenry/Brushfire Graphics

Company in England showed that it was in principle possible to conceive a plan for applying their technical skills as draftsmen, engineers, and computer operators, not toward the military technologies that were at the time their company's chief products, but toward more socially desirable technologies, such as aids for the disabled or novel forms of community transportation. Ideas for the types of machines that were needed, but were not being provided through the market for one reason or another (such as limited production runs), were gathered from a wide number of community groups. As a result, several prototypes — such as a vehicle with two sets of wheels, able to travel either on roads or on railway tracks — have subsequently been developed (although outside the company).<sup>6</sup>

In other European countries a different way of experimenting with the application of scientific knowledge to social problems is being explored through what are known as “science shops” (or, in France, as *boutiques de science*). These could, again, form part of an alternative science and technology policy aimed at meeting community needs by offering a channel through which members of the community can gain direct access to scientific and technical expertise. The science shops originated in Holland in the mid-1970s as an outgrowth of the Dutch radical science movement, the first being created at the University of Utrecht in 1973. (See “The Amsterdam Science Shop: Doing Science for the People” *SfIP* Vol. 11 No. 5) Their three principal goals are to provide tech-

nical information on demand to individuals or the representatives of community groups who come to the “shops” requesting it; to promote socially relevant research within Dutch universities; and to explore ways of linking this research directly to those working in the areas where it is needed. An important element in the science shop philosophy is the way access to its services is determined. At the University of Amsterdam, for example, requests for assistance are only accepted from those who have not been able to pay for someone to carry out the research, who promise not to use the results they are given for commercial purposes, and who are able to make productive use of the research results once they are obtained. In this way the science shops are intended to act as a kind of “knowledge broker,” mediating between university scientists and members of the outside community, finding ways of connecting university research directly to specific social needs, yet bypassing the conventional commercial channels through which these needs are usually addressed.<sup>7</sup>

So far nothing comparable to the Lucas plan or the science shops has been tried in the United States. There have nevertheless been various attempts to explore ways of making available alternative channels of scientific and technical expertise. In Mountain View, California, the Mid-Peninsula Conversion Project, partly funded by a grant from the Science for Citizens Program of the National Science Foundation, has been exploring ways of making science and technology available to com-

munity groups, such as labor unions or disabled veterans, who might not otherwise have access to it.<sup>8</sup> Other groups across the country are exploring ways of applying high technology products to community-based activities. The New Mexico Solar Energy Association has been exploring how microcomputers can help small, self-sufficient farmers make the best use of local resources;<sup>9</sup> in California a small company has developed a technique for linking a personal computer to a hand loom, making it possible to quickly transfer new fabric patterns designed on the computer screen into products that are competitive with machine-made fabric manufacturing. Similarly the California Agrarian Action Project is looking at ways in which biotechnology might be applied to the needs of small-scale organic farmers, for example by improving the overall protein balance in organically-grown foods. Other examples of such "bootstrap community revitalization," exploiting the potential of high technology to help provide an alternative source of livelihood to those displaced by the mainstream economy, are being pursued in groups and collectives across the country.<sup>10</sup>

There is less to report on the third point on the spectrum at which pressure for an alternative science policy needs to be applied, namely the question of maintaining public access to the fruits of publicly funded research. Other countries have shown that it is possible to keep this access open; thus in Britain the National Research Development Corporation, a product of the post-war Labour government, had several major successes to its name in helping to move research results into the community before its rights to patents from government-funded research were removed in 1983 as part of Prime Minister Margaret Thatcher's campaign of privatization. In the U.S. a few Washington-based lobby groups, in particular Ralph Nadar's Health Research Group, have vociferously opposed changes in legislation that have steadily removed the public's right to direct access to the results of the research it has paid for; but these groups have had little impact against the economic and political forces moving, as in Britain, in the opposite direction. On the international front, several developing countries have been pushing for changes in the Paris Convention, the agreement signed initially in 1883, under which countries indicate their willingness to respect a certain common set of rules on patent protection. The developing countries want greater control over the way that outsiders can use patents to manipulate market conditions (for example, by buying up patents merely to keep competitors out, but not using them to produce goods); however, the more the developed countries have realized the economic and political importance of patents, the more opposed they have become to the developing countries' proposals for a change in the rules.

The need and the scope exist for a broad reassessment of the patent system, both domestically and internationally. Would it be possible to grant certain social groups privileged access to patented research results (as

currently most scientists are free to use the research results of others, even if they have been patented, on the grounds that they are not put to commercial ends)? Could new public institutions be created responsible for creating links between university scientists and outside groups wishing to use their research, but without going through commercial channels? Are alternatives to patents possible that would provide both an incentive and a limited reward to individual scientists without the need to provide this reward by guaranteeing monopoly control of the market? Should certain areas of science, such as research into various tropical diseases, be acknowledged sufficiently important to humanity that they should be considered unpatentable — or, alternatively, should all patents in these areas be granted to an international agency, such as the World Health Organization?<sup>11</sup> None of these questions, simple as they may sound, is straightforward. Nevertheless, they are the types of questions that must be addressed by anyone seeking to challenge the present system, under which patents are almost universally used to tighten the control of private corporations over the use of scientific knowledge, and thus to restrict the access to this knowledge of others exploring alternative ways of applying it to social needs.

### **Mounting the Challenge**

Research, access, application: these, then, are the three fields in which the political values expressed through science lie open to challenge. What about the other dimension in our matrix, those groups in a position to mount such a challenge? The first is the women's movement. Part of the broad critique of the values embedded in science developed in the early 1970's was the demonstration that science was essentially a man's world. The majority of scientists are men, for reasons that range from the way girls are put off the "hard" sciences at school to the competitive pressures that discriminate against a scientist who chooses to put substantial effort into a nonscience activity such as child-rearing. It also tends to be men who select the way science is applied, even to women's needs. The liberal response is to argue for more opportunities for women in science, in other words for more women to be given the opportunity to fill the roles currently played by men. The more radical argument is that part of the problem lies in the roles themselves, and that the values expressed through science tend to be male values (illustrated, for example, by the predominance on the White House Science Council — and previously the President's Science Advisory Committee — of members representing the hard sciences such as physics and mathematics over the soft sciences of biology and sociology). "The problem is not one of making women more scientific, but of making science less masculine," says Liz Fee of Johns Hopkins University. "When masculinity is seen as an incomplete and thus distorted form of humanity, the issue of making science and technology less masculine is also the issue of making it more completely human."<sup>12</sup>

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**T**he women's movement has already shown how different strategies can be used at different positions on the science-society spectrum. Some, such as Fee, have concentrated on the need to change the conditions within the laboratory, and thus implicitly the form of the knowledge that emerges from laboratory research. Others have focused on the application end, exploring ways that women, either individually or in groups, can control the use of those technologies that most directly affect them, particularly in medicine and childbirth.<sup>13</sup> Women's groups have also been actively engaged in campaigns to protect those in other countries against the side effects of modern medical technologies, such as the contraceptive Depo-Provera. And in Britain women have been among the most militant opponents of the deployment of cruise missiles, symbolized by a year-long, ongoing demonstration outside the Greenham Common Air Force Base. Through such actions the women's movement has already shown that it is likely to remain one of the most consistent and powerful voices demanding changes in the way control over science and its applications is distributed.

A second group is made up of the labor unions. American unions, even less than their European counterparts, do not have a history of deep involvement in political debates about science; it is likely to be a long time before the U.S. sees anything comparable to recent developments in France, where laboratory technicians, nominated through their unions, now sit on some of the policy committees of the principal research-funding agency, the Centre National de la Recherche Scientifique.<sup>14</sup> Nevertheless, there are signs that this involvement is increasing. In the mid-1970s it was generated largely by struggles around occupational health and safety issues, where it was recognized that there was a need to challenge the judgements of scientific experts on, for example, the carcinogenicity of new chemical compounds. During this period officials working with unions such as the Oil Chemical and Atomic Workers and the United Steelworkers discovered at first hand how scientific research could be manipulated to provide results that appeared neutral, but in fact represented political and economic, as much as scientific choices. They also learned the importance of gaining access to the scientific information on which decisions were made, information that companies tried to protect using the argument that it involved trade secrets, but which the unions argued was essential for an informed dialogue on the impact of production techniques on the health of their members.<sup>15</sup>

Other unions, such as the International Association of Machinists, became involved in broader technological issues, such as the safety of nuclear power. Their interest partly reflected a direct interest; those whose members worked as operators in nuclear power plants

favored stringent safety requirements, while those employed in power-plant construction were frequently opposed, for they felt the impact of tougher safety standards through higher production costs, expressed in canceled orders and thus lost jobs. Among the more progressive unions, however, there have been signs of a spreading awareness of the broad political challenge to democratic politics being mounted through the control of science and technology.<sup>16</sup> Several prominent union members agreed to serve on a new commission established by Ralph Nader in 1983 to survey the growing impact of private corporations on university research. Others have become active members of the newly-formed Committee for Responsible Genetics. At the grassroots level, union members have organized around demands for a direct input into decisions about the new technologies they are expected to work with; some have begun to explore variations on the ideas of the Lucas work force for directing technical skills toward the production of socially useful products.<sup>17</sup> And the Reagan administration's attack on occupational health regulations has done as much as anything to demonstrate that scientific issues need to be firmly placed on the political agenda of the labor movement.

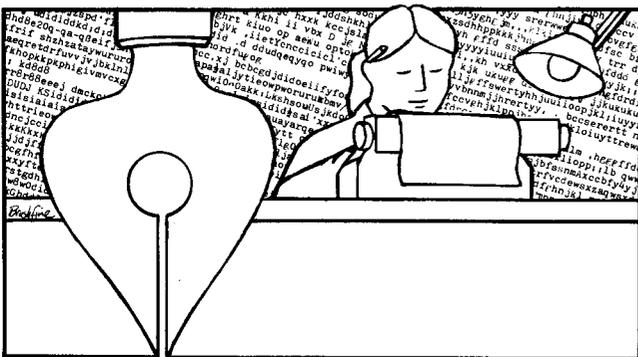
### Putting Science in Its Place

The environmental movement is, like the women's movement, already moving firmly in this direction. Many environmentalist groups, such as Friends of the Earth and the Natural Resources Defense Council, have played key roles in challenging the conventional channels of scientific decision-making. In the laboratory such groups frequently spearheaded campaigns for stricter controls on recombinant DNA research and greater community participation at both the local and national levels in decisions about this research. More broadly, the central focus of the environmental movement has been to find ways of mitigating the social and environmental impact of science-based technologies, from the use of chemical pesticides to the threats of global annihilation raised by the spread of nuclear technologies, in whatever form. While some groups have continued to present nuclear power as one area in which it is necessary to separate rational from irrational choices (e.g., "safe" from "unsafe" working conditions), others, such as the Abalone Alliance in California, have begun to show how the whole nuclear debate is embedded in a politically determined rationality that, like Frederick Taylor's scientific management, expresses political goals within the neutral-sounding language of science.<sup>18</sup>

The frustrations experienced by many environmentalist groups during the Carter administration, together with the frontal attack to which they have been subjected under President Reagan, have demonstrated

the increasing need for such groups to think in political as much as single-issue terms. This is partly a question of embracing a broader agenda; those concerned about the way science is used should, I have suggested, be equally concerned about the way it is produced, as well as about the restrictions placed on its dissemination. The experience of the Office of Technology Assessment, or the National Institutes of Health's Recombinant DNA Advisory Committee, shows that isolated campaigns that ignore this broader political perspective can quickly lose their effectiveness.

It is also a question of building new alliances around these issues. Already efforts have been made by groups such as Environmentalists for Full Employment to bridge the gaps between environmentalists and the labor movement, showing how apparent conflicts between the two (such as the claim that tougher environmental regulation means fewer jobs) are illusory, and that, as the Reagan administration's attack on regulation in all guises has shown, they have many political needs in common.<sup>19</sup> In the past a major weakness of the alternative technology movement was its failure to address the problems encountered in the lives of the majority of the population, who find themselves locked into a technological system they cannot escape without making a major sacrifice. Many are unprepared to experiment with new technologies if this means giving up the economic security of a full-time job; indeed, for



Keith McHenry/Brushfire Graphics

many the fight to retain a job during a period in which modern technology is threatening to create an ever-lengthening unemployment line has inevitably become an issue that takes precedence over any discussion about the conditions under which work is carried out.

The worsening employment situation, however, is making it more important than ever before for political movements to address issues around technology that were already framed by the counterculture movements of the 1970s. At that time new forms of work were pro-

posed as alternatives to the alienation of the assembly line and the destruction of natural resources by science-based technologies; today such work has become an economic necessity for those who find themselves pushed to the margins of the economy. Groups such as the newly-formed Intermediate Technology Development Group of North America, based on the "small is beautiful" idea of economist E.F. Schumacher, are now exploring new ways of revitalizing communities through self-help schemes that, while drawing on some of the high technology (such as personal computers) offered by the mainstream economy, place it in a context of self-management and self-reliance.<sup>20</sup> The gap between such initiatives and the more conventional political activities of the labor unions and the environmental movement remains wide; but it is a gap that must be bridged if either is to achieve long-term success.

**T**he final set of groups that offer the hope for an alternative science policy are those pressing the demands of the less-developed nations. The scientific needs of these countries demand little elaboration, nor do the barriers that recent experiences (from the United Nations conference in Vienna in 1979 to recent attempts to establish a Biotechnology Center for the Third World) have shown to be formidable. There are a few groups in the U.S., such as the Washington-based Center for Concern, that have begun to address these issues. Nevertheless, it is an area that the Third World countries must themselves develop the technical and political skills to address. Much is already happening on this front. The debates that took place during the Vienna conference itself, as well as those that have taken place within agencies such as the United Nations Conference on Trade and Development (UNCTAD) in Geneva on the economic and political consequences of patent laws, indicate the height of current awareness about how much needs to be done and where. Furthermore, over the past ten years even the once radical ideas of Schumacher have now gained broad endorsement through bodies such as the Organization for Economic Cooperation and Development.

The danger here remains that development will be portrayed as a technical problem — even if the technology is "intermediate" or "appropriate" — rather than one that also has deep political roots.<sup>21</sup> It is not up to those from the developed world to prescribe which technological strategies are the most appropriate for these countries; nevertheless, it is up to us to help ensure that important opportunities are not foreclosed. This means confronting the various ways that policies created by the advanced industrialized nations to exploit their leadership in science can undermine the efforts by developing countries to enjoy the benefits of science without at the

*Continued on p. 33*

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# STATISTICAL PROPAGANDA AND THE NUCLEAR ARMS RACE

by Brett Silverstein

America is a land of technology, advertising, investment, science and “the bottom line” — that is to say, of numbers, figures, graphs, and percentages. Statistics allow us to summarize and make sense of complex masses of information. But, as expressed in the aphorism from which this article takes its title, figures don’t lie if liars don’t figure; while statistics appear to be and often are descriptions of reality, they can be easily manipulated.

Some types of mathematical chicanery are used more frequently than others, and it is not difficult to learn to recognize the most common statistical tricks. In order to demonstrate these tricks, in this article I will focus on the nuclear arms race, an area about which much of the knowledge of the American public is based on statistics released by the government and the media.

The first question to ask when you see a chart, a graph, or a number is, “Exactly what statistic is being reported?” For example, the November 30, 1981 *Newsweek* and the *New York Times* eight days earlier featured charts depicting U.S. and Soviet nuclear weapons and launchers. A quick glance at either chart may have left many readers with the impression that if the U.S. does not deploy new weapons, the Soviets will have a large lead in the arms race. What might have caused a careless reader to come to this conclusion is that these charts counted only medium-range weapons based in Europe. The *Newsweek* chart did not mention that only certain weapons were included. But the *Times* chart was headed, “Two views of theater nuclear forces in Europe,” so a careful reader need not have been confused. A very careful reader might even have noticed that in parentheses buried in the middle of the accom-

panying article the *Times* reported that the U.S. has a commanding lead in the kinds of nuclear weapons that were not included in the chart.

The same kind of selection of statistics lay behind President Reagan’s “zero option” plan for nuclear disarmament in Europe unveiled in 1982. In that proposal, the U.S. offered to forego placing Pershing and Cruise missiles in Europe if the Soviets would remove from Europe their SS-20s, supposedly leaving both sides with zero nuclear missiles in Europe. On the surface this proposal appears to be fair. Of course the “zero” in the “zero option” is based on a very careful selection of the weapons to be counted. The proposal leaves out a few facts: 1) the U.S. medium-range weapons counted in the proposal and in the charts discussed above are based on foreign territory and are capable of hitting the Soviet Union, while the Soviet medium-range weapons are based on their own soil and are incapable of reaching the United States; 2) the proposal includes only nuclear weapons carried by land-based missiles, which constitute most of the Soviet arsenal, but does not include the nuclear weapons carried by American bombers and submarines stationed in and around Europe; 3) the proposal does not count the nuclear missiles of our allies France and Great Britain, even though everyone knows that those missiles are meant to be used against Soviet forces. We will return to these last two points in the section on comparisons later in the article.

The moral of this “zero-option” analysis is that if you are not absolutely certain of the exact statistic being reported, ignore it.

## Estimates and Predictions

The next question to ask when you are confronted with a statistic is, “How was it calculated?” Of course, this is not always easy to answer, but there are a few rules of thumb to use to avoid being manipulated. One is to check to see if the statistic was based on an estimate. Estimates are like information from un-

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attributed sources in newspapers: they are sometimes necessary but they are never to be completely trusted.

For example, when the U.S. military establishment wants to build support for increasing the military budget it often releases figures on Soviet military expenditures. Whether or not these figures are so labelled, they are always estimates made by U.S. intelligence agencies. The first problem with these figures is that like any other budgetary estimate (think of the estimates you make at different times on the amount you spend on entertainment, for example) they fluctuate widely over time.

On October 23, 1975 (p.8) readers of the *New York Times* learned that the CIA estimated that the Soviets spent 6-10% of their Gross National Product (GNP) on defense. Three months later, on February 23, 1976 (p.13) *New York Times* readers discovered that the CIA estimated that the Soviets spent 10-15% of their GNP on defense. About a week after that, on March 1, readers of *Newsweek* (p.38) found out that "...the Soviet Union allocated 15 per cent or more of its Gross National Product to the military." And two months after that, on May 8, readers of the *Times* discovered that the Defense Intelligence Agency estimated that the Soviets spent "about 20 percent" of their GNP on the military. So in just over a six-month period official estimates of Soviet military spending ranged from 6% to 20% of GNP — more than a threefold increase.

And the estimates have not become any more accurate recently, as indicated in the November 19, 1983 *New York Times* (p.6): "The Central Intelligence Agency said today that Soviet military spending, especially for procurement of new weapons systems, had grown more slowly over the last seven years than previously thought."

Further doubt is cast on the estimates by the method used to arrive at them. In the most frequently used method described in the October 23, 1975 *New York Times* (p.8): "the intelligence community takes all the Soviet weapons, forces and research and attempts to determine how much it would cost the United States to finance a comparable program." But, according to economists on the Joint Economic Committee of the U.S. Congress who are cited in the same article, this approach exaggerates Soviet military costs. The exaggeration is due to the higher cost in the United States than in the U.S.S.R. of the materials used by the Soviet military.

For example, U.S. soldiers receive more training and higher pay than do Soviet soldiers. Furthermore, this method will inevitably exaggerate the military costs of another country since the armed forces of a country are likely to use the materials that are cheapest in that country, but not necessarily cheapest in the United States, in building and equipping its military. But American intelligence agencies would use the U.S. price of a material that is rare (and expensive) in the U.S., but cheap and abundant in the U.S.S.R., in estimating

Soviet defense expenditures, thus greatly inflating the estimate.

Two conclusions may be drawn from this example: 1) the United States has played fast and loose with its information on Soviet defense spending; 2) never place complete trust in an estimate.

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**Some types of mathematical chicanery are used more frequently than others, and it is not difficult to learn to recognize the most common statistical tricks.**

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### Statistical Palm Reading

Predictions are estimates that are relatively easy to check for accuracy years after they are made. The U.S. military has often relied on predictions when asking for more money. This is because for the last 35 years the United States has been the strongest military power in the world. Periodically it becomes difficult for the military establishment to convince American citizens and the U.S. Congress that they should spend ever higher amounts to add to this power. The obvious answer that the military has given to the question, "Why should we sacrifice even more scarce resources when we're already number 1?" has been, "We may be ahead now but if we don't increase our spending we will fall behind in the future." This type of prediction is particularly effective when it is made by a military expert and when it includes specific details as to how far ahead of us the Russians will be in a particular type of weapon by a particular date because the expertise and the details give the prediction an aura of accuracy.

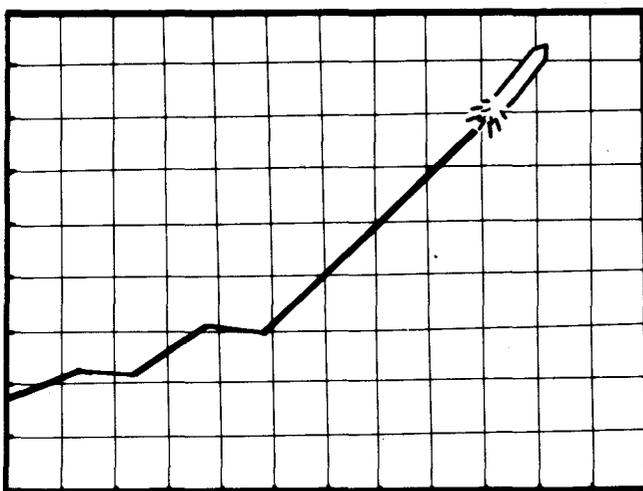
For example, in 1956 General Curtis LeMay, at that time the chief of the Strategic Air Command, was reported in the May 27 *New York Times*, as predicting that "...the Russians would have by 1959 twice as many long-range bombers as the United States." While I do not have the 1959 figures for long-range bombers, every figure that I have ever seen has shown that the United States has not only never fallen behind the U.S.S.R. in long-range bombers, it has maintained a lead sometimes as large as 5-to-1.

On February 23, 1959, *Time* magazine (p.22) reported that then-U.S. Secretary of Defense McElroy predicted that by the early 1960s we would be behind the Soviets in intercontinental ballistic missiles by 3-to-1. Coincidentally, 17 years later, on March 8, 1976 (p.35), the same magazine reported in another scare article entitled "That Alarming Soviet Buildup" that in 1965 the U.S.S.R. had 224 ICBMs to the 854 of the United

States. Secretary McElroy had been wrong on two counts. First, rather than a 3-to-1 lag, the U.S. advantage was almost 4-to-1. Second, as in the case of the long-range bombers, instead of being behind the Soviets we were way ahead. So much for predictions.

### Sources

Ideally, the accuracy of a statistic should have little to do with who is reporting it, but that is not the case. If the user of a statistic has an obvious ax to grind and is not citing a reliable, relatively unbiased source or one that can be checked, then your best bet is to either check some other sources, ignore the statistic, or at least be skeptical of it. This is particularly true for estimates and predictions which leave so much room for political manipulation.



Thus people reading the *New York Times* reports of government estimates of Soviet defense spending should have immediately become skeptical upon reading such statements as “At a time when the defense budget is in serious difficulty in Congress, the Defense Department is letting out new, still preliminary intelligence estimates suggesting that the Soviet Union is widening its lead over the United States in defense spending” as was reported on page 8 on October 23, 1975 and “The general conclusion that the Soviet Union is outspending the United States on defense has become one of the principal arguments used by the administration in justifying a proposed \$14 billion increase in the defense budget for the coming fiscal year...” reported on February 28, 1976 (p. 12).

### Comparisons and the Art of Confusion

Statistics frequently take the form of comparisons. Defense spending in 1983 is compared to defense spending in 1965 or U.S. missiles are compared to Soviet missiles. Comparisons such as these are often very important but they do leave room for two types of manipulation.

The first manipulation is in the selection of the statistics being compared. We have already seen how the comparisons between the nuclear arsenals of the United States and the Soviet Union are affected by the selection for comparison of just medium-range weapons or of weapons located in Europe. Two other selections are also frequently used to make America look like it is behind in the arms race.

The first is the focus on the number of ICBM’s (land-based intercontinental ballistic missiles) that either side has. The Soviet Union now has many more ICBMs than does the United States. This is because the United States divides its nuclear arsenal equally among ICBMs, submarine-launched missiles, and bombers (the so-called defensive “triad”). The Soviet Union has a bomber force made up primarily of propeller-driven planes and a submarine force which is hampered by the lack of coastline in the U.S.S.R. on which to locate ports.

But even comparing the combined number of missiles is misleading because, as Henry Kissinger pointed out during the debate on the SALT II treaty, missiles don’t kill anyone, warheads do. That is to say, a missile, which can now deliver many independent warheads, is the equivalent of a gun, whereas the warheads, which perform the actual destruction, are the equivalent of bullets.

Frequently the U.S. government and media focus on launchers and ignore warheads. In one chart presented in the March 1, 1976 *Newsweek* (p.38), 10 different categories of weapons were compared for the U.S. and the U.S.S.R. but warheads were not included. A chart on the front page of “The Week in Review” section of the November 28, 1982 *New York Times* presented a comparison of the arsenals of the two superpowers, showing total missiles (they’re ahead), total missiles and bombers (they’re ahead), total missile warheads (they’re ahead), but not a comparison of total warheads (we’re ahead).

This focus on launchers instead of warheads becomes particularly obnoxious when it is used by the U.S. government, which: 1) instituted the final emplacement of more than one warhead per missile (MIRVs) over some objections by the Russians; 2) only agreed to a limit on American ICBMs in the SALT I treaty because the number of warheads was not limited; 3) added about twice as many new warheads during the period the treaty has been in effect as were added by the Soviet Union during that time; 4) still tries to scare Americans by pointing to the Soviet lead in missiles rather than to the U.S. lead in warheads.

A similar tactic used by the United States is to focus on megatonnage — that is, the destructive power of the warheads — or on the closely-related measure of throw-weight, which is the power of the missiles to project a certain number or size of warheads. On first analysis, megatonnage seems to be a logical statistic to worry about. After all, isn’t the arms race really a competition

in destructive power? But by this point it should come as no surprise that something is left out of this analysis. That something is missile accuracy. The killing power of any bomb, called its "lethality" by experts, is a function of both its size and its accuracy. In fact, an increase in accuracy increases lethality more than does a comparable increase in megatonnage. The United States, which is able to produce giant bombs if it wants to, has chosen to focus on smaller, more numerous, more accu-

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**American news sources will often focus on megatonnage, illustrating their stories with drawings of medium-sized U.S. missiles next to giant Soviet missiles. These same news sources, however, do not mention accuracy or lethality.**

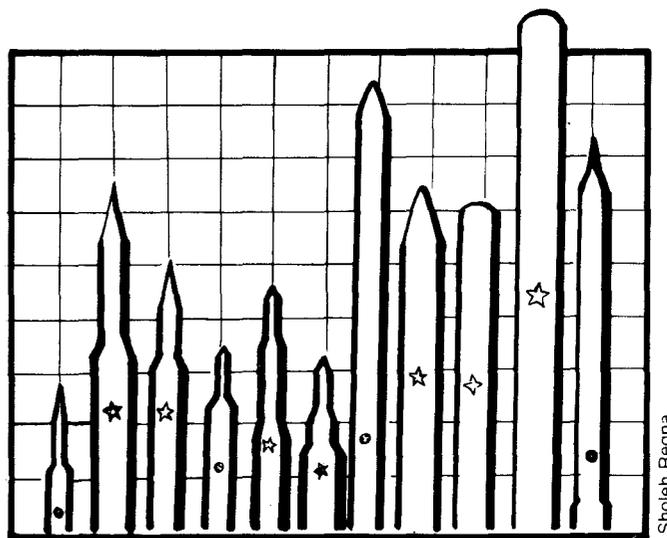
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rate warheads. Barash and Lipton point out that the U.S. Minuteman II missile, which carried a single warhead of one megaton, was replaced by the Minuteman III, which carries three warheads of 170 kilotons (about one-sixth of a megaton) each. But since the new warheads are more accurate, the lethality of each missile doubled despite a 50% drop in megatonnage. Nonetheless, American news sources such as the March 21, 1982 *New York Times* (section 4, p.1) will often focus on megatonnages, illustrating their stories with drawings of medium-sized U.S. missiles next to giant Soviet missiles. These same news sources, however, do not mention accuracy or lethality.

In addition to questioning the selection of the measure used in any comparison it is important to question the selection of the two comparison points. If, for example, a statistic for one point in time is being compared to the same statistic at another point, you should ask yourself whether time is the most relevant dimension of comparison and, if so, whether these two particular points in time make the most sense for the comparison. For example, an October 24, 1982 (p.56) *New York Times* article on U.S. military policy reported that, "The Navy, which had 888 active-duty ships in 1965, now has 490. Active-duty Air Force aircraft totalled 12,689 in the fiscal year 1964, but 7,194 this year." A careful reader should not begin to worry about U.S. preparedness without questioning the importance of a comparison of the number of our ships and aircraft now with the number of much less advanced ships and aircraft in the past.

A comparison that is more misleading and more common is illustrated by the chart that accompanied the above discussion of ships and aircraft. The chart pre-

sented U.S. military spending each year from 1962 to 1982. There was an obvious comparison between spending now and spending in the past. The chart showed that military spending is now quite a bit lower than it was in the period 1967 through 1970 and left a casual reader with the impression that the U.S. is not devoting enough resources to the military. What is not explained in the chart is that the United States was fighting a war in Vietnam during the late 1960s and it is ridiculous to compare military spending at times of war with spending during times of peace. It would be more informative to compare recent military spending with military spending just before or just after the Vietnam war. Such comparisons,



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however, would show that the amount spent on the military in 1982 was greater than the amount spent during the earlier peacetime years.

Another issue involving comparisons is what is excluded from them. The most common comparison reported regarding the arms race is between the Soviet Union and the United States. From the point of view of a macho competition as to "who's number one," that comparison makes the most sense. But from the point of view of defense, it makes more sense to compare the military strength of groups of countries that are allied to one another. Sometimes the American media does compare the military capabilities of the NATO forces with those of the Warsaw Pact forces, but often they do not. American allies like Great Britain are superior militarily to Russian allies like Poland, which means simple U.S.-Soviet comparisons understate our security. But even NATO-Warsaw Pact comparisons may not be enough because the NATO totals do not include the military strength of Japan, Australia, or Israel or the nuclear weapons of France. NATO-Pact comparisons also exclude China, which has many soldiers on the Soviet border, has nuclear weapons, and considers the Soviet Union at this time to be its worst enemy.

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## Proportions and Percentages

One of the most commonly used statistics is the proportion or its close relative, the percentage. A proportion is calculated by dividing a numerator — defense spending, for example — by a denominator, such as the GNP or the total federal budget. The simple question to ask when confronted by a comparison of proportions or percentages is “if proportion A is greater than pro-

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**Once adept at decoding statistics, curious readers can more easily go about finding where the real stories are in daily news—between the lines and graphs of the articles.**

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portion B is it because the numerator of A is higher, because the denominator of A is lower, or both?” While this may seem like a boring exercise in mathematics, it often has important implications.

Upon learning that the CIA estimates that the Soviet Union spends more of its “GNP” on the military than does the United States, one must ask, “Is the Soviet proportion higher because its defense spending (numerator) is more or because its GNP (denominator) is less?” The CIA answer to that question is “both” but you don’t always learn that from the media. In a March 1, 1976 article entitled “Is America No. 2?,” *Newsweek* magazine reported that “...the Pentagon is no longer crying wolf when it contends that the rapid growth in Russian power has become a major threat to American security...The Soviet Union allocates 15 percent or more of its gross national product to the military, versus 5.4 percent in the U.S.” (p. 38). Having sufficiently scared its readers, *Newsweek* attempted two pages later to reassure them somewhat by drawing a number of comparisons between the economies of the U.S. and the Soviet Union. The chart containing these comparisons was headed “How The Giants Measure Up: Although the Soviet Union has achieved parity with the U.S. in military power and is strong in heavy industry, it still lags badly in many categories, including agriculture, technology and the good things of life.”

Many points could be made regarding the statistics presented in this chart but of most relevance to us at this point is the comparison of the Gross National Products of the U.S., \$1,499 billion, and that of the U.S.S.R., \$873 billion (est.). Thus, without even making the connection between the two statistics, the article supplied information on page 40 that allows us to calculate that the estimated GNP of the Soviet Union was just 58 percent as large as that of the United States. Therefore, the 15 percent of their GNP that the Soviets were reported to spend on defense was equal to about 8.7 percent of the GNP of the United States. Informed readers might

also have known that on February 23, 1976, a week before the *Newsweek* article appeared, the *New York Times* reported that the U.S. was spending 5.5 to 6 percent of its GNP on defense, and on March 8, 1976, a week after the *Newsweek* article appeared, *Time* magazine reported the U.S. figure as “about 6%.” So even if the estimate of GNP was not a wild guess and the estimate of defense spending was not inflated (as demonstrated earlier in this article), the appropriate comparison would have been between a U.S. figure of perhaps 6 percent of GNP spent on the military and a Soviet figure equivalent to 8.7 percent of the U.S. GNP.

One other aspect of statistical comparisons deserves attention. That is missing comparisons. It is often helpful to think about the comparison that might add to your understanding of a statistic even when that comparison is not presented and then to keep your eyes open for, or perhaps even seek out, the missing information. So a reader of the U.S. government pamphlet *The Soviet Threat*, confronted with a photograph of a Soviet nuclear submarine standing on end placed next to a photograph of the Washington Monument might think to her or himself, “Gee. That Soviet sub is as big as the Washington Monument. That’s real big. I wonder how large a comparable American submarine is?” The answer is that American submarines are just as large as Soviet subs but the comparison in the pamphlet is not designed to present that information. Only some thought and the search for the missing comparison would allow a reader to resist the obvious attempt of the U.S. government to mislead and scare its citizens.

There are a number of other statistical tricks to be aware of but they are used infrequently in arms race propaganda so I will not detail them here. People interested in learning about these other tricks might read *Statistics for Social Change* by Lucy Horwitz and Lou Ferleger.

## The Bottom Line

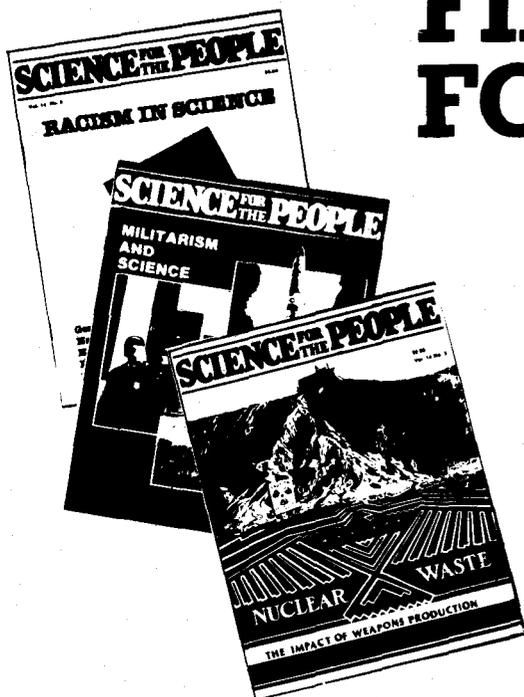
Statistics, like other fields of science, is an inherently political subject. Unlike the speech writer, who uses words to make a political argument, the statistician has numbers as his or her tool. It should not come as a great surprise that political arguments are made just as effectively (if not more so) with numbers as with words.

The critical news reader has the burden of looking past the veneer of science to challenge the political underpinnings of statistics. By being aware of how statistics dovetail easily with political arguments, readers of mainstream news publications can develop a better technique of sorting out the useful information from the political propaganda that is routinely injected into the typical news story. Once adept at decoding statistics, curious readers can more easily go about finding where the real stories are in daily news — between the lines and graphs of the articles. □

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# HOW MAGAZINES COVER S

## Journalism Abdicates its Watchdog Role

by Barbara Beckwith

A debate has continued for ten years now over genetic explanations for human social behavior. The controversy first centered on sociobiological theory; more recently the focus has been on sex hormones and brain structures as explanations for social differences, especially between the sexes.

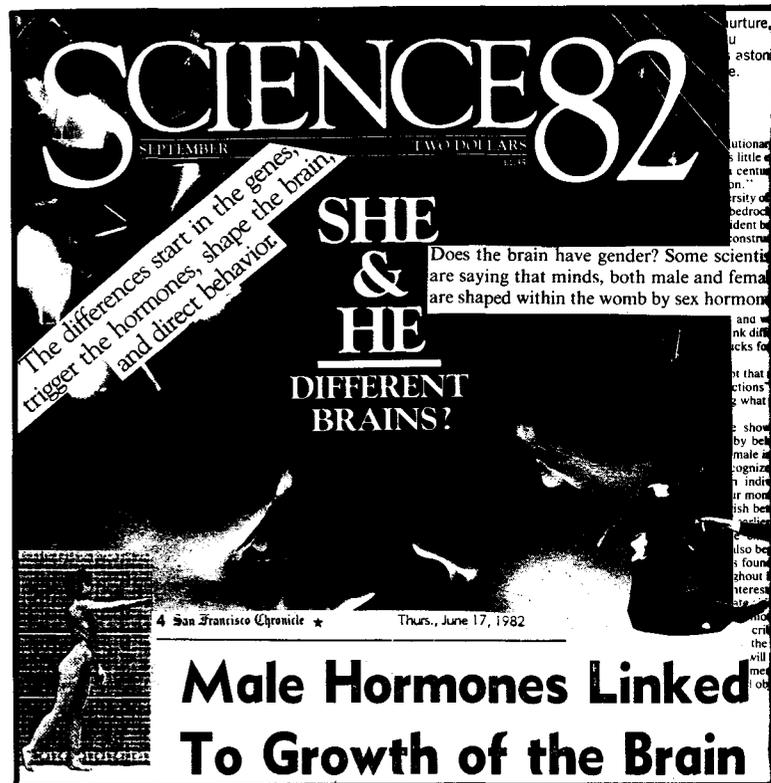
Scientific journals have covered that debate to a certain degree, although much of their coverage is skewed in favor of genetic explanations and away from positions taken by their critics. Readers of *The New York Times*, for example, are usually informed about these issues through the filter of science writer Boyce Rensberger, a sociobiology enthusiast.

But what about the public in general? What do nonscientists or nonacademics know of "genes-and-gender" theory and the debate about it? Over the last five years, mass circulation magazines have taken on genes-and-gender science as a favorite topic. The ongoing debate over the validity of those theories, however, has not met with the same enthusiasm. Most of the popular press announce genes-and-gender "findings" without giving their readers an inkling of the existence of critics.

Genes-and-gender science has sold well in a whole spectrum of popular magazines. In 1981, *Newsweek* devoted six pages to the behavioral sex differences in an article titled "How They Differ — and Why." *Discovery* ran "The Brain: His and Hers" that same year, and *Science 82* followed with a "He and She" article the next year. *Science Digest* ran an 8-article feature in 1982, asking "Are Sexual Standards Inherited?" and answering with an enthusiastic yes. *Redbook* and *Parents* 1980 articles advised parents how to treat their sons and daughters in light of the "new research." *McCalls* printed its own study of maternal "baby hunger" in 1981 and followed up in 1982 with an article on how men cope with women whose urge have babies they don't feel or understand. *Ladies Home Journal* chimed in with a "fun piece" on women's maternal instinct. *Playboy* spent seven months in 1982 exploring biological explana-

tions behind sex-role differences. *Cosmopolitan* published four articles on the topic that same year, with titles such as "Is Anatomy Destiny?" and "Why the Sexes Still Rage at Each Other."

Genes-and-gender articles span the full spectrum of popular magazines, from newsweeklies to science, sex, education and women's magazines. Most fail to mention there is no consensus among scientists that such con-



nections make logical or empirical sense. In effect, such coverage panders to conventional sex-role prejudices by telling readers "science" supports their biases. Popular magazines use genes-and-gender theories as justification for keeping things as they are. The five most popular science magazines — *Science Digest*, *Science 84*, *Discover*, *Omni* and *Psychology Today* — have printed genes-and-gender articles virtually ignoring the debate going on

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

# SEX DIFFERENCE RESEARCH

about the issue. Those five have a combined circulation of 2.3 million. In contrast, *Science for the People* which has extensively critiqued gene-based social theories, has a readership of approximately 4,000.

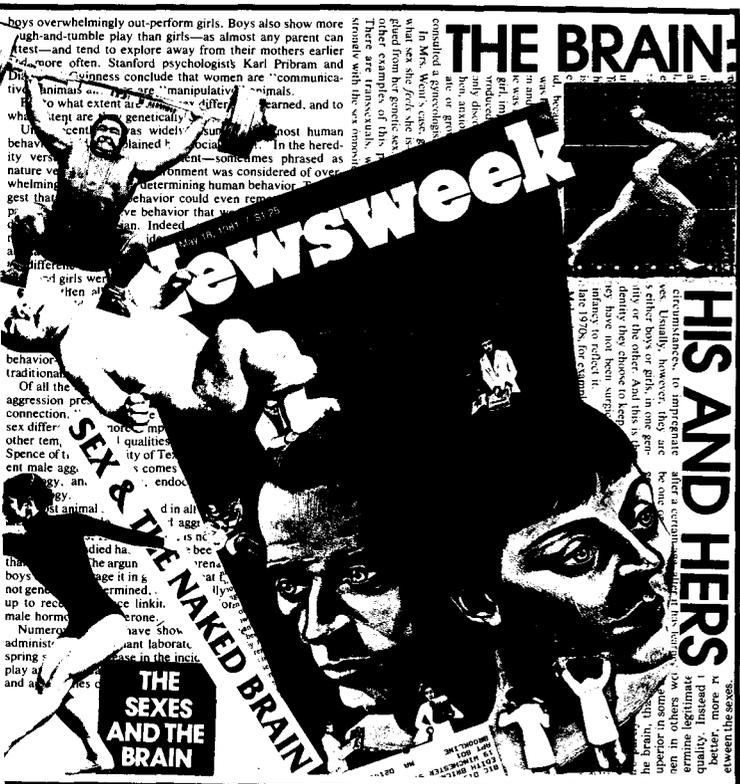
Popular science magazines seem eager to use genes-and-gender research to justify problematic social behaviors. In 1982-3, *Science Digest* ran four articles treating genetic explanations for polygamy, rape, depression in women and the sexual double standard as hard news. As recently as May, *Science 84* posited as evolutionary adaptations female child battering, female infanticide and third-world nutritional neglect of women.

coin." In its seven-article series, *Playboy* goes on to describe in detail the theories and data of 55 genes-and-gender researchers without citing a single critic. When the authors of that series were asked during a June 1983 television debate why they had included no criticism in their presentation, they replied that this had not been their topic.

*Cosmopolitan*, *Playboy's* popular sexual counterpart for women, published four articles in 1982 alone on biological explanations of sex-role differences. "Authorities now say nature, NOT nurture, makes him thump and thunder while you rescue lost kittens," writes *Cosmopolitan*. "Intersex tyranny," *Cosmo* explains to its (mostly female) readers, is caused by "instinctive and conflicting urges" between the sexes. Citing genes-and-gender theory, *Cosmo* concludes women should not pressure men to change — to fight less, or nurture more — since "nurturing does not come naturally. It is not instinctive but learned behavior." Readers are advised, if their men are mean, that "snarling won't help. He was just being male."

*Playboy* and *Cosmopolitan's* combined circulation is 7.5 million. In addition, a condensation of the *Playboy* series, its sexual content toned down, was read by *Reader's Digest's* 30 million readers. Clearly, a sizeable chunk of the American public is being exposed to a one-sided picture of the genes-and-gender debate.

Traditional women's magazines are slightly more cautious, but not much. *Mademoiselle's* 1981 article acknowledged scientists are divided on the validity of research showing sex differences in math skill and aggressiveness. But despite the frequent use of "might" and "could" in the body of the article, its conclusion is that of "science...coming to believe" men and women may have built-in limits and tendencies such as the tendency (in men) to roam and defend territory and responsiveness (in women) to infants. A controversial issue becomes an emergent truth, and a divided scientific community is reduced to a single entity. A lighter approach is taken by the *Ladies Home Journal*, in an article focusing on the maternal instinct, "the secret 'sixth sense' shared by all mothers." With it, a mother can intuit when her son needs a tongue-lashing from his father and when he needs "a manly hug." Her husband has no such innate ability.



Dana Collier

## A One-Sided Picture

Sex magazines are equally intent upon applying genetics to sex roles. "Word has begun to leak out from the cool, impartial world of scientific inquiry," writes *Playboy* in 1982, "that men and women are chemically and behaviorally as different as two sides of the same

## Finding the Critics

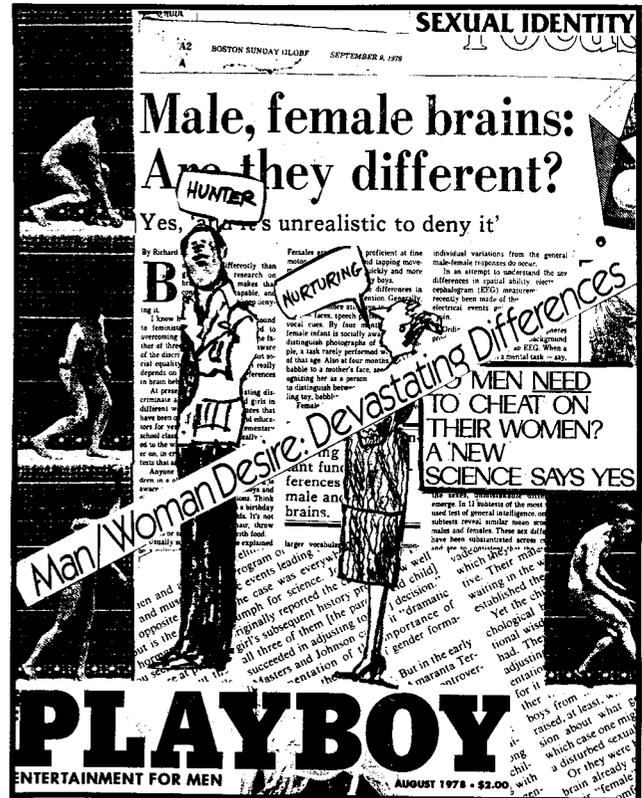
Both of the widely-read newsweeklies, *Time* and *Newsweek*, are careful, when reporting on gene-and-gender science, to include arguments on both sides. But in a more subtle way, their coverage stacks the deck in favor of genetic explanations. *Newsweek* cites six critics among thirty quoted sources in a 1981 article, "The Sexes — How They Differ — and Why." But it then calls biologically-oriented explanations "an emerging body of evidence" that "scientists now believe." Moreover, of the critics it plays up most are "hardcore feminists" who put women researchers under "Lysenkoist pressure to hew to women's liberation orthodoxy." Not one of these female viragos is named or quoted; they remain anonymous foils through which critics are associated with dogmatism. In contrast, genes-and-gender researchers are clearly identified as reputable academics. University of Chicago psychologist Jerre Levy, for instance, is introduced as "a pioneer in studies of brain lateralization."

Similarly, *Science Digest* uses feminist critics as comic foils. A July 1982 article introduces them with an anecdote about the bishop's wife's reaction to Darwin's evolution theory: "Descended from the monkey? My dear, let us hope it isn't true! But if it is true, let us hope it doesn't become widely known!"

The message is clear: critics of biological explanations for sex-roles stand in the way of the advancement of science. The article goes on to quote 17 sources favoring biological explanations for human social behavior, one anonymous source against, while Harvard sociobiologist E.O. Wilson is termed a "pioneer" at the head of "the newly-kindled light of sociobiology." Objective science is portrayed as being besieged by dogmatic militants and feminists. The very real split in the scientific community over sex-difference biology is not acknowledged.

Despite such treatment in the mainstream media, critics are not hard to find. Book-length critiques have been written or edited by Richard Lewontin, Janet Sayre, Marshall Sahlins, Lila Leibowitz, Ashley Montagu, Ruth Hubbard and Marion Lowe. They sit on the same bookshelves as genes-and-gender theorists Helen Fisher, David Barash, Sarah Blaffer-Hrdy, Daniel Freedman, Donald Symons, Richard Dawkins and Melvin Konner. Critiques by Stephen Jay Gould are as available as genes-and-gender textbooks by E.O. Wilson. A journalists need only look.

Unfortunately, once a journalistic bandwagon gets going, magazines tend to rush to get on. The result is self-fulfilling prophecy: publishers see unanimity as confirmation of the significance of the issue. In the rush, some magazines settle for reprints. A limited number of writers can spread a story among a dozen magazines. Richard Restak's article on sex differences in the brain appeared in *Education Digest*, *Reader's Digest*, and *Newsweek*. Scott Morris wrote genes-and-gender articles for *Psychology Today* and *Playboy*.



Mary Batten's 1982 *Science Digest* article reappeared in *Cosmopolitan* the next year, its sexual connotations beefed up. Not that *Science Digest's* version was asexual: while "cooler" than *Playboy*, it nevertheless titillated readers with suggestive titles and nude illustrations.

## Justifying Male Sexual Violence

Sex, in fact, seems to be a major reason why popular magazines are eager to write about genes-and-gender research. The topic supplies readers with a rich assortment of bizarre sexual anecdotes. *Playboy* regales its (mostly male) readers with accounts of sixty-pound elephant penises, chimp testicles which product "huge amounts of sperm" and red deer stags' "sneaky-fucker strategy." Connections to humans are accomplished through simple anthropomorphic imagery. *Playboy* talks of a male fly that "tries it" with a raisin and a boot; *Cosmopolitan* describes plants that "get attention by exposing themselves — at least one male fly has been caught ejaculating on a blossom."

Both *Playboy* and *Cosmopolitan* promote more than sex; they provide biological justification for strict sex-roles and sexual violence. A February 1981 *Playboy* concludes males are "compelled by their gender to be rogues" and advises men: "If you get caught fooling around, don't say the Devil made you do it. It's the

Devil in your DNA." In April 1981, *Playboy* suggests rape is very likely "a strategy genetically available to low-dominance males that increase their chances of reproducing by making more females available to them than they would otherwise." The February 1981 *Psychology Today* makes the same suggestion. Genetic explanations for rape were fully critiqued by Val Dusek in the January/February 1984 *Science for the People*. But 960,000 more people will hear *Psychology Today's* interpretation.

Even more alarming is *Cosmopolitan's* eagerness to justify male sexual violence. A May 1982 article promises to "provide a new perspective on human rape, wife-beating and other forms of sexual aggression." *Cosmopolitan* then describes an assortment of non-human "sexual tricksters," "mating game conflicts" and "death by sex." The article concludes with advice to its (female) readers to take "guilt-ridden nightmares from the closet, sweep out tangled webs of Freudian fantasies, and simply have fun." The astonishing message: rape and wife-beating are dismissable as gene-based and fun.

Magazines whose readership is not sex-oriented focuses on sex-roles instead of sex. A 1980 *Commentary* article uses genes-and-gender research as proof that affirmative action quotas and textbook "indoctrination into sexual equality" should be stopped. A 198 *Education Digest* article, citing brain research, proposes setting up different learning sequences for boys and girls "to allow for their separate predispositions." Clearly,

genes-and-gender research is popular in part because it justifies traditional sex differences. Another part of the explanation lies in how journalists view science in general.

### Science Journalists: Not Critically Oriented

According to Rae Goodell, associate professor of science writing at the Massachusetts Institute of Technology, the press tends to take "an upbeat, 'science saves' view of science." "Journalists react with awe, excitement or resentment toward scientists, but all too rarely with common sense," writes Goodell in a November/December 1980 *Columbia Journalism Review* article." Since science journalism programs have generally not been critically oriented, according to Goodell, science journalists have allowed themselves to be intimidated by high-status scientists. "Most science journalism education has a trade orientation that views science news as value-free, apolitical hard news." Such an education doesn't prepare journalists to look for more than one side to a science story.

Ohio University journalism professor Sharon Dunwoody points out that science writers tend to work in "inner-circles," sharing story ideas, sources and background information. As a result, they often publish the same news instead of making independent judgements about what is worth printing, writes Dunwoody in a 1980 *Science, Technology and Human Values* article.

### An Historical Parallel

A striking parallel with the current popularization of genes-and-gender science is found in the early part of this century when popular magazines promoted the theories of the newly founded "science" of eugenics. Led by *Popular Science Monthly* edited by James McKeen Cattell (a major figure in the mental testing movement), these magazines inundated the public with articles describing the latests "findings" on the genetic basis of criminality, racial differences in intelligence and the genetic inferiority of many immigrants. For instance, a series of articles was published in the years 1913-1915 in Cattell's journals with the titles "Going through Ellis Island," "A Study of Jewish Psychopathy," "Mendelian Inheritance of Feeble-mindedness," "The Biological Status and Social Worth of the Mollato," "Heredity, Culpability, Praiseworthiness and Reward," "Eugenics with Special Reference to Intellect and Character," "Immigration and the Public Health," "A Problem in Educational Eugenics," "Women in Industry," "Economic Factors in Eugenics," "The Racial Element in National Vitality," "Eugenics and War" and "Families of American Men of Science." All promoted the ideas that social behavior and aptitudes were genetically determined. These popular articles included ones written by leaders of the eugenics and mental testing movements, such as E. C. Thorndike, C. B. Davenport and Cattell himself.

Similarly, *Atlantic Magazine* in 1914 published "The Decadence of Human Heredity" suggesting reduced "multiplication of the defective classes" and increased fecundity of Harvard and Yale graduates. The January, 1914 issue of *Outlook* featured an article by Theodore Roosevelt, "Twisted Eugenics," which urged sterilization of eugenics to prevent the "race" from dying out. The *Saturday Evening Post* was also a great fan of the eugenicists, including articles such as "The Great American Myth" and "Plain Remarks on Immigration from Plain Americans" (in 1924) which called on Americans to "breed the black sheep out of our flocks." Other popular magazines, newspapers and the respected *Scientific American* also presented the views of the eugenicists uncritically.

The result of this barrage of uncontested eugenics propaganda in the popular media was to provide strong popular support for the sterilization laws, miscegenation laws and for the Immigration Restriction Act of 1924 which tremendously reduced the influx of immigrants from the supposedly "inferior" nations. Let us hope that the current wave of enthusiasm for biological determinist theories among the contemporary counterpart of the magazines of the early 1900's does not lead to similarly strong consequences.

— Jon Beckwith

Scientists, too, work in "inner-circles." "There is a tendency for a department to perpetuate the kind of research it is already doing," says Harvard biologist Ruth Hubbard. "There's a heavy self-selection toward people who think the same way." Departments hire researchers who hold compatible views. Journalists who don't go beyond a researcher's department to ask questions might never find out the researcher's work is under debate.

When scientists and journalists become too-comfortable allies, the public may lose out. If readers can't shop at the full "marketplace of ideas," they won't have a chance to sort through contradictory reports from competing sources and decide for themselves what to think.

Science appears in the press largely as a subject for consumption rather than critical scrutiny, according to science writer Dorothy Nelkin in a May 14, *Boston Globe* article on science and the media. Political questions of scientific responsibility and ideological priorities that guide scientific choice are seldom considered news," writes Nelkin. As a result, "the public's need to know about science — its problems as well as its promises — is often poorly served."

"Scientists, and the data we produce, are not and cannot be free from the prejudices, ideologies, or interests of the larger society," writes Karen Messing, University of Montreal genetics professor. Her article in the book *Women's Nature: Rationalizations of Inequality* points out each step in the scientific process where bias, particularly sex and class bias, enters in. First, bias is found in the selection of scientists and their access to space, equipment, grant money and "old-boy networking." Next, the choice of a research topic is influenced by the researcher, the researcher's employer, and the grant provider. Then, the way the research hypothesis is posed and carried out, especially the choice of study population, controls, method of observation and data analysis all areas where biases are exhibited. Finally, the publication and popularization of results depends upon the researcher's status, how results fit accepted dogma, and the researcher's desire to influence public opinion.

Few scientists or journalists take Messing's view of science as influenced by sex and class. For example, Harvard University sociobiologist E.O. Wilson insists his work is value-free and apolitical. "My interest has been to keep my personal political biases from influencing my conclusions about human nature. In the past few years, I've allowed my beliefs to float free in order to be as fully objective as possible," says Wilson in a *Boston Magazine* interview. But numerous analyses of Wilson's writings point out how bias has affected his choice of data and conclusions.



Dana Collier

In contrast, Northeastern University anthropologist Lila Leibowitz is frank about the lens she sees through. "I have a preconception about human beings as socially adaptive products of plasticity," Leibowitz explained in a recent interview. Harvard University biologist Ruth Hubbard is similarly aware of her own frame of reference and how it differs from genes-and-gender scientists. "There are people who are for whatever reasons of their own past history of living in this world, want to believe the world is the way it is because that's the way it has to be," said Hubbard in an interview. "They temperamentally prefer a deterministic mold. Others like to think there are a lot of options, that things happen to be the way they are for very particular reasons that you can understand and alter. That certainly is my picture."

Most science journalists view science as neutral, and report scientific research as straight news. By doing so, they deprive the public of the marketplace of ideas they are entitled to. By filtering the controversy about genes-and-gender research so that only one side gets through, popular magazine writers serve to shore up the status quo. In this way, mass circulation magazine coverage of genes-and-gender theory affects public policy. The notion of the "different natures" of men and women is profoundly conservative, and can influence public policy on affirmative action, day care, the sexual double standard and parity in employment and political power. Genes-and-gender theories also reinforce traditional attitudes toward rape and other forms of sexual violence. In the end, the self-serving zeal with which popular magazines have embraced genes-and-gender science can have disastrous effects on women.

**POPULAR MAGAZINE ARTICLES ON  
BIOLOGY AND SEX ROLES**

Except for those published in *Ms.*, most of these articles present uncritically the views of those scientists who propose that gender behavior is biologically programmed.

*Commentary*: "The Feminist Mystique" by Michael Lewin, 12/80.

*Cosmopolitan*: "Is Anatomy Destiny?" by Tim Hackler, 3/82.  
"The Brain: Something to Think About" by Jonathan Tucker, 5/82.

"Why the Sexes Still Rage at Each Other" by Jane Clapperton, 5/82.

"How to Have Sex If You're Not Human" by Mary Batten, 5/82.

*Discover*: "The Brain: His and Hers" by Pamela Weintraub, 4/81.

*Education Digest*: "Brain Behavioral Differences" by Richard M. Restak, 4/80.

"Do Boys and Girls Need Different Schooling?" by Carlotta Miles, 4/81.

*Ladies Home Journal*: "Only a Mother Would Know . . ." by Shirley Lueth, 5/81.

*Mademoiselle*: "Men vs. Women: What Difference Do the Differences Really Make?" by Annie Gottlieb, 7/81.

*McCalls*: "How Different Are Girls and Boys?" by Dr. Lee Salk, 9/79.

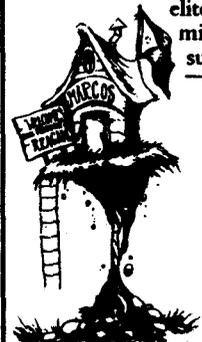
"Baby Hunger" by Lois Leiderman Davitz, 11/81.

"How Men Really Feel About Babies" by Lois Leiderman Davitz, 6/82.

*Ms.*: "The 'Math' Gene and Other Symptoms of the Biology Backlash" by Nancy Tooney, 9/81.

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"Watch Out: Your Brain May Be Used Against You" by Vivian Gornick, 5/82.

"Tired of Arguing About 'Natural Inferiority'?" by Naomi Weisstein, 11/82.

*Newsweek*: "Just How the Sexes Differ," 5/18/81.

*Omni*: "Sex and the Split Brain," 8/83.

"Animal Feminism" by C. Johmann, 8/83.

*Parents*: "The Truth About Sex Differences" by Susan Meun-  
chow, 2/80.

*Playboy*: "Darwin and the Double Standard" by Scott Morris, 8/78.

"Why Do Men Rape?" by Richard Rhodes, 4/81.

"The Sexes: A Mystery Solved?" by Jo Durden-Smith and Diane de Simone, 1/82.

"The Sexual Deal: A Story of Civilization" by Jo Durden-Smith and Diane de Simone, 2/82.

"The Sex Life of the Brain" by Jo Durden-Smith and Diane de Simone, 3/82.

"The Sex Chemicals" by Jo Durden-Smith and Diane de Simone, 4/82.

"The Perils of Paul, the Pangs of Pauline" by Jo Durden-Smith and Diane de Simone, 5/82.

"The Main Event" by Jo Durden-Smith and Diane de Simone, 6/82.

"Prisoners of Culture" by Jo Durden-Smith and Diane de Simone, 7/82.

*Psychology Today*: "Sexual Selection in Birdland" by D.P. Barash, 3/78.

"Eros and Alley Oop," David Symons interviewed by Sam Keen, 2/81.

*Quest*: "Male and Female—Why?" by Jo Durden-Smith, 10/80.

*Reader's Digest*: "The Other Difference Between Boys and Girls" by Richard Restak, 11/79.

"Is There a Superior Sex?" by Jo Durden-Smith and Diane de Simone, 11/82.

*Redbook*: "Should We Treat Our Son and Daughter Just Alike?" by T. Berry Brazelton, 8/80.

*Science 82*: "He and She" by Melvin Konner, 9/82.

"Symons Says" by Roger Bingham, 1-2/83.

"Margaret Mead: The Nature-Nurture Debate and On Being Human" by Boyce Rensberger, 4/83.

*Science Digest*: "Sexual Choices" by Mary Batten, 3/82.

"Sociobiology: Rethinking Human Nature" by Richard Nalley with contributing articles by Mary Batten, Nancy Solomon, E.O. Wilson, Rachel Wilder, 7/82.

"Sex Machines" by Duncan Anderson, 4/82.

"Birth of Your Sexual Identity" by Jo Durden-Smith and Diane de Simone, 9/83.

*Time*: "Why You Do What You Do: Sociobiology, A New Theory of Behavior," 8/1/77.

"Male Dominance Revisited" by John Leo, 9/22/80.

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# WHOSE HEALTH AND WELFARE?

## The Press and Occupational Health

by Chris Anne Raymond

*“The question of occupational health is the question of worker control. No issue raises a greater challenge to the managerial prerogative, a greater challenge to capitalism.”<sup>1</sup>*

The effort to open workshop practices to worker scrutiny, as embodied in state “Right to Know” legislation, touches on a broader issue: how to increase worker awareness of occupational health hazards and issues. Workers obtain information from many sources: union representatives, fellow workers, employers, OSHA and COSH groups, and from written technical data sheets. Cornell University’s Dorothy Nelkin and Michael Brown have interviewed chemical workers in a variety of settings to determine what workers know, how they know it, and what they do about the dangers they face earning a living. (See Brown and Nelkin’s article, *Knowing about Workplace Risks*, *SftP* Vol. 16 No. 1). Their evidence indicates that there are barriers to information at every level, from the shop floor to union halls and government agencies<sup>2</sup>.

Besides these more traditional avenues of information, occupational health topics are also covered by the press, thus shifting the locus of information from the workplace to the broader public. The press, of course, covers many labor issues other than occupational health, including union politics, strikes, and management-labor relations.

Although workers do not depend primarily on the press for occupational health information, labor leaders are recognizing the key role that the media play in conveying and shaping public images of their constituents

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and their concerns. For example, a study of network news and entertainment programs, commissioned by the International Association of Machinists, concluded that workers and working-class issues were seldom covered, and when they were, the images were unfavorable. Workers were shown as ignorant, militant, and unlikable, and their concerns were portrayed as unworthy of serious attention — an image which is likely to harm labor’s efforts to work for its members in the public arena<sup>3</sup>.

**The mass media image of occupational hazards and American society denies the structural reasons which make it both necessary and profitable for industry to ignore health safety.**

The mainstream press’ portrayal of occupational health takes a different tack. Instead of focusing on the negative attributes of workers, it portrays the positive attributes of the capitalist system. The tendency of the mainstream press in covering occupational hazards is to suggest that the government, despite some bureaucratic inefficiencies or excesses, effectively drafts legislation, polices industry, and eliminates hazards. Evidence I have gathered — based on both interviews with journalists, and labor activists, and a content analysis of nearly 300 newspapers and magazine articles in eight publications — indicates that, with some notable exceptions, the mass media image of occupational hazards and American society denies the structural reasons which make it both necessary and profitable for industry to ignore health and safety and to actively work to prevent systematic change.

In the pages of national publications such as the *New York Times*, *Newsweek* and *U.S. News and World Report*, journalists suggest the existence of occupational hazards is due to unintentional oversight or benign "ignorance" by otherwise socially responsible companies. These publications tend to show government agencies as overly zealous watchdogs. In essence, they cover occupational health issues divorced from the context of class structure and struggle.



This perspective shapes press coverage of a broad array of occupational health topics, including hazards in the nuclear power industry, DBCP and pesticide workers, toxics in the microelectronics industry, genetic screening, asbestos, and OSHA politics itself<sup>6</sup>.

#### Nuclear Hazards: All in a Day's Work?

Typical of mainstream press coverage of the nuclear industry was a *New York Times* report of an explosion in a nuclear reactor facility in Hanford, Washington<sup>7</sup>. The report strongly implied that the workers harbored little, if any concern about hazardous working conditions. Interviews with workers and "experts" in the local area served to characterize accidents at nuclear power and processing plants as insignificant mishaps, atypical of the industry's safety record as a whole.

One worker quoted expressed great faith in the plant's "good safety program"; another offhandedly compared his own exposure to radioactive dust to getting an inkstain on his hand — both, he says, are easily washed off and forgotten. Another person, a woman

whose relatives work at the facility, was quoted to the effect that the air in her bank is probably more dangerous than that in the workplace environment.

Other *New York Times* reports on nuclear power workers in the late 1970s maintained the same perspective: workers psychologically and physically unaffected by their proximity to highly radioactive material, and an industry whose safety standards are either excellent or in the process of being upgraded through minor increases in staff and improvements in training<sup>8</sup>.

Coverage of transient nuclear workers — so-called "jumpers" — exemplifies this framework. Jumpers are hired to repair valves or clean up spills in nuclear power or fuel reprocessing plants. The workers get their name from the nature of the job: brief but intense exposure to radiation. In exchange for using up their "bank" of permissible lifetime exposure, jumpers receive handsome pay — an attractive proposition to the many unemployed unskilled workers across the country.

A 1979 *New York Times* piece reported on the jumpers phenomenon, focusing on the "increasing official concern" caused by the large numbers of temporary workers being hired by the nuclear industry. The article, through a series of vignettes with jumpers, cast their work in a rather benign light. This hazardous job was described as a "vocation" or "part-time career" for underemployed folksingers and brassy housewives<sup>9</sup>.

**"Interviews with workers served to characterize accidents at nuclear power and processing plants as insignificant mishaps, atypical of the industry's safety record as a whole."**

Concerns about the lack of regulatory oversight of workers' accumulated radiation exposures are answered by pointing to the efforts of government officials to revise and upgrade protective standards. The implications are that any problems which have cropped up are new ones peculiar to hiring jumpers, and that some additional rules are all that is needed to solve the problem. Occupational health problems in the industry are blamed on isolated instances of negligence.

#### DBCP: Natural Disaster?

The DBCP case is another example of the type of coverage given to occupational health in the mainstream press. In the summer of 1977, evidence was uncovered

linking exposure to the pesticide DBCP (dibromchloropropane) to testicular cancer and sterility among workers at an Occidental Chemical (Oxy) plant in California.

The general approach in the eighteen *Newsweek* and *New York Times* articles was to treat these revelations as if they were a natural disaster, a sudden and unforeseeable accident, to which the industry and government responded wisely and forthrightly. In the rhetorical words of an Oxy worker quoted in the *New York Times*:

Today, Mr. Bricker, who has two children, blames himself in part for not pursuing the matter (sterility) sooner, instead of just talking about it. He gets angry when he thinks about the situation. Some of his co-workers, he confides, are thinking about lawsuits. But, he adds, "Who are you going to blame?"<sup>8</sup>

In the *New York Times*' coverage, DBCP itself became the "villain." Dow officials who vowed to "get on the far side of playing it safe" were not challenged. Instead, the news reports conveyed the image of a system reacting to crisis. *Newsweek* told its readers that Dow and Shell "quickly suspended both the production and sale of the chemical" once "the sterility factor had been established." Both publications' articles focused on the "quick" action taken by the Labor Department to issue new emergency exposure standards, set up studies, and search for related hazards. In the words of one *New York Times* piece, government and industry were "playing a grim game of catch-up" to recheck chemicals assumed safe under old, inadequate standards. The existence of nearly twenty-year-old studies linking DBCP and cancer in rats, and the cozy relations between agrichemical companies and California Department of Health are mentioned only briefly, or not all.

### The Advocacy Press: The Worker's Story

There is a competing view of occupational hazards which is seldom found in the dominant mainstream media outlets. People who regularly read such left-wing advocacy press publications as *Mother Jones*, *The Progressive*, and *In These Times* will find an analysis of occupational health issues which emphasizes the structural basis of work hazards. Articles in these and other weeklies and monthlies do not portray inequalities in power between workers and owners as beneficial or benign. Nor do they ignore the coercive power which corporate elites have at their disposal to delay passage and enforcement of regulations.

All three of these publications mentioned above consistently reported on occupational health from the workers' perspective, highlighting the systemic links between government agencies and companies which result in hazards. Their coverage of the nuclear industry and DBCP draws on this context to present a contrasting view of ongoing events.

### Nuclear Power: Dying for a Living?

Advocacy press coverage of nuclear power differs from mainstream coverage in several ways. First, the advocacy press reports on all stages of the nuclear fuel cycle, including uranium mining. Second, workers' accounts of work practices are given serious attention and legitimacy. Finally, critical attention is paid to the disparity between written regulations and actual shop floor practice.

Articles in both *The Progressive* and *Mother Jones* magazines argue that the jumpers' economic straits set them up to be taken advantage of, that their training is little more than a deceptive and dangerous charade, and that they are knowingly and wilfully being exposed to unhealthy levels of radiation.<sup>9</sup>

For example, one jumper told an undercover *Mother Jones* reporter that, "It's easy to laugh when you know you're going to die," and then adds, "Money is money. I've got a family to support." Another jumper, interviewed by *The Progressive's* Catherine Quigg, told her that, "It was not only the best paying job I could find...it was the only job I could find. I took it without knowing exactly what kind of work I'd be doing."



Both *Mother Jones*' and *The Progressive's* articles argue that the workers never do find out the true nature of the hazards they encounter, a perspective which contrasts with the *New York Times*' portrayal of the rather happy-go-lucky folksinger-turned-nuclear-worker. Furthermore, both articles assert that the safety problems of the nuclear industry are far from isolated or unusual. Rather, they contend that the hazards, like leaks and accidents, are inherent in the structure of the industry and regulatory system.

Coverage of uranium miners also graphically illustrates different assumptions advocacy press journalists make about the nature of work hazards. *In These*

*Times*, in a piece entitled, "Navajos Mined Cancer," strongly argues that the Atomic Energy Commission knowingly permitted indigent American Indians to be exposed to cancer-causing ore dust, without bothering to warn them.

*The Progressive's* article, "Bury My Lungs at Red Rock," quotes workers extensively about dangerous work practices and conditions. Like the story in *In These Times*, it accuses the Bureau of Indian Affairs and the AEC of acting as brokers for, not regulators of, the big nuclear companies. This cozy relationship reaps large profits for business and government at the expense of the powerless and impoverished, according to reporter Tom Barry<sup>10</sup>.

Other advocacy press coverage of nuclear power also reflects a different attitude towards workers as sources. *The Progressive* did a two-part series detailing nuclear worker Joe Harding's efforts to expose unsafe, but nevertheless officially condoned, work practices<sup>11</sup>. Unlike the typical treatment of workers' reports in the daily mainstream press, Harding's comments were not immediately put in doubt by quotes from outside "experts."

#### **DBCP: Corporate Crime?**

Advocacy press coverage of DBCP characterized the pesticide-cancer link as evidence of a corporate crime, a far from isolated instance of deliberate cover-up and government and business footdragging<sup>12</sup>.

*In These Times'* coverage highlighted the historical precedents to the DBCP discovery. The lead in one article compared DBCP to the Phosvel scandal of 1976. Workers told the Liberation News Service reporter that Oxy denied that any health problems existed, despite evidence of testicular cancer in rats dating back to 1961.

**"Labor leaders are recognizing the key role the media play in conveying and shaping public images of their constituents and their concerns."**

Both the state and federal government are accused of duplicity. Officials from the California Department of Health are portrayed as arrogant and condescending — chuckling at suggestions that the evidence demanded an outright ban on DBCP — and as captives of agribusiness. OSHA officials are characterized by writer Daniel Ben-Horin as

a row of ants diligently moving crumbs from Pile A to Pile B, while a huge feast looms all around them, totally beyond their engineering capacity.



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Worker actions, given scanty attention in *Newsweek* and the *New York Times*, are highlighted here, including the unions' initiative in conducting independent health tests, and its success in forcing the company to install new ventilation systems (and eventually, to shut down completely). Such coverage transmits a message that union solidarity is a vital counterweight to corporate power.

The need to fight for workplace control plays a central role in all the advocacy press accounts of occupational health issues. Workplace activism around health and safety issues receives regular, if not voluminous coverage. Such coverage reflects a philosophy expressed by people like union activist Stanley Aronowitz, quoted at the beginning of this article.

Such a challenge to the existing economic arrangements in society is not issuing from the pages of the daily mainstream press, despite its professional self-conception as public watchdog. There are a number of reasons for this. Part of the problem in mainstream press coverage of occupational health is its dependence on "official" sources. Instead of seeking out (and taking seriously) shop floor accounts of working conditions and practices, mainstream reporters seem content to accept the views of both experts with credentials and corporate executives — views which tend to be clearly biased in favor of the status quo. These sources are preferred because they are judged as more accessible, more articulate, and more "in tune" with the assumptions of the middle-class editors and journalists than are workers<sup>13</sup>. In the sample of mainstream newspapers and magazines reviewed by this author, labor sources accounted for 31% of all occupational health sources quoted, and 44% of total inches — and most of these sources were national or state labor leaders, not workers. In the advocacy press, by comparison, the figures were 48% of the sources and 83% of the total inches.

When I spoke with one disillusioned ex-labor reporter to find out how his city editor handled tips from workers, he said, "Nine times out of ten, he'd say, well, if something official hasn't been filed, we can't do anything."<sup>14</sup> The "strategic ritual" of objectivity, as sociologist Gaye Tuchman has called it, demands that reporters consult only those who are assumed to be in a position to "know the facts."<sup>15</sup> The subjective assumption underlying this ritual is that workers do not have the required knowledge. Advocacy press coverage is based on a different view: that when it comes to talking about the workplace, workers are the experts.

The other major factor shaping mainstream press coverage is a set of assumptions about the relationship between politics and the economy. Former Oil, Chemical and Atomic Workers Union health and safety director Anthony Mazzocchi told me, "The media are willing to go after the story, no holds barred, but they're not willing to look at the problem as integral to our economy. Cancer is the cornerstone of the industrial society."

**"Mainstream reporters seem content to accept the views of both experts with credentials and corporate executives — views which tend to be obviously biased in favor of the status quo...Advocacy press coverage is based on a different view: that when it comes to talking about the workplace, workers are the experts."**

Such a broad, structural view is not typical of mass press reports. More common is the view that occupational hazards result from the deeds of a few negligent companies, from ignorance, or as a result of "just not very much common sense," in one news reporter's words<sup>16</sup>. This view hardly leads to reporting which critically analyzes how productivity, profits and health and safety violations are intimately connected. In contrast is the view of *Progressive* editor Robert Buell, who says, "You can't separate occupational health and safety from the economic structure as a whole...tighter regulations or administration isn't going to change that much. Regulation is skewed by the distortions of economic power."<sup>17</sup>

A content analysis of 299 newspaper and news magazine articles for suggested causes of and solutions to occupational hazards supports this comparison of reporters' views. A third of the advocacy press' suggested causes had a structural basis. For example, many advocacy press articles emphasized the close links between profits, productivity, and occupational hazards, or the complementary relationship between industry and government interests. Only seven percent of the mainstream press coverage focused on such factors. Instead, journalists for these publications "blamed" progress itself, bureaucratic red-tape, workers' lifestyles or genetic traits.

A similar pattern marked the two press' suggested remedies. The advocacy press favored workplace action twice as often as the mainstream press did, and it suggested strikes and more militant unions as important factors in preventing hazards. The mainstream press favored government action, including the passage of legislation, better regulatory mechanisms, and improvements in workplace training and engineering — all coverage which implies that the system can provide solutions to occupational hazards.

The issue of the contrasting reporting of occupational health issues extends beyond the relative biases of either the mainstream or the advocacy press. Every news story invites readers to pursue some questions and to ignore others. This is true of any attempt to make sense of social events and issues. In the case of occupational health, where there is so little conclusive scientific evidence and so much at stake politically and economically, ideological frameworks are even more likely to shape news coverage.

However, the competition between such competing frameworks of analysis is hardly a balanced one. The mainstream press' version of events reaches many millions of readers via hundreds of outlets, while the advocacy press has a much smaller, if perhaps more dedicated, readership. The mainstream press' accounts predominate in the public domain, setting the agenda and shaping the contour of public debate. Such dominance has broad implications for the workers' ability to fight for change.

Before workers can effectively secure their health, two things must happen: they have to know about the hazards they face and their causes, and they have to have the political resources to act on that knowledge. As Nelkin and Brown point out, the media — mainstream or advocacy — are a relatively minor source of substantive information about occupational health hazards in comparison to information from unions, government, and technical channels.

However, the journalists' choice of frameworks in which to cover occupational health can influence both the workers' awareness of the broader sociopolitical

context and, more importantly, their political power base as well. By failing to question the underlying structural basis of occupational hazards, and by portraying the current system as functional and rational, the mainstream media can help to prevent the cultivation of an important political resource: a critically informed, angered citizenry more concerned with the health and welfare of workers than the health and welfare of industry.



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# SFTP LOOKS AT POPULAR SCIENCE MAGAZINES

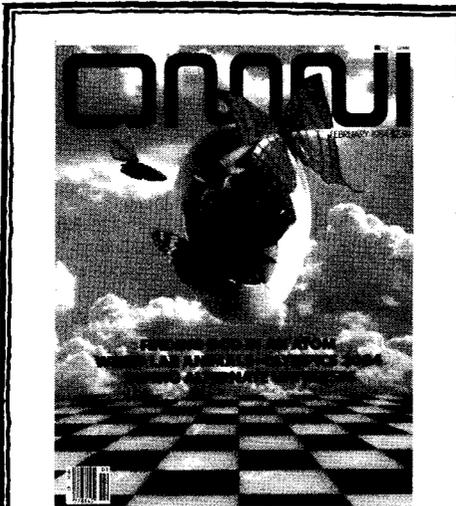
by Seth Shulman

A trip through the science section of the newsstand could easily lead one to believe that solutions to all of our problems lie just around the corner. A recent sampling of magazine headlines included the following: "The Coming Cure for Cancer," "How To Make Nuclear War Obsolete," and "Satellite Rescues: A New Era Begins." Unfortunately, a guided tour of popular science magazines reveals more about the magazines themselves than it does about our society's rate of problem solving.

One would think that the devastating consequences which many scientific "breakthroughs" have wrought might cause headline writers to be at least somewhat more cautious. Living with the realities of nuclear power, chemical weapons, and toxic waste to name a few, one would think it to be very difficult today to hold the position that science and technology are neutral, that a scientific or technological discovery can be divorced from its impacts and implications, or that new technology will eventually solve all of our problems. Yet, to a disconcerting degree, these are exactly the claims one finds regularly in most of the popular science magazines.

In glossy magazines with titles like "Discover," "High Technology," and "OMNI," with owners like the Hearst Corporation and Time, Inc., the coverage of such diverse fields as military technology, genetic engineering, and computer technology tend to take on a glaringly promotional tone about the potential of new technology to solve pressing social problems. In their efforts to market their products, editors of the popular science magazines seem to feel that only the breakthroughs, the new discoveries, will "sell" science and technology to the public. Consequently, articles in these magazines routinely steer away from more complex, substantive policy questions where the politics and uncertainty of science come into play. Topics such as what to do about

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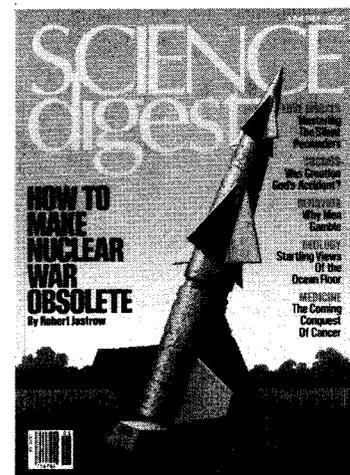
**OMNI**  
 "The Magazine of Tomorrow"  
 Circulation: 825,000  
 Founded: 1978  
 Owner: Bob Guccione,  
 Publisher Penthouse magazine

water contamination, or the military funding of academic science will rarely, if ever, grace their pages. Perhaps even worse, when they are covered, the article will most likely make a claim that a simple solution is in the offing.

Such an attitude on the part of the media is misleading today, but it is all the more inexcusable in light of the historical record. In many ways such reporting is reminiscent of the unbridled high expectations during the early years of nuclear power when the Eisenhower administration spoke of "Atoms for Peace," and the media depicted the potential dangers and problems in a painfully naive way, focusing instead on how cheap electricity would be. Such a simplistic, wide-eyed attitude towards new technologies without regard to their social and political implications was hard to justify at that time; clearly we can't afford it now. Nonetheless, it is still foisted upon us with an enthusiasm

that might even be catchy if one hadn't seen much the same claims last month and last year.

Take, as a fairly random example, the cover story of the recent June 1984 *Science Digest*, Hearst Corporation's entry into the popular science field (where, as they tell us "fact is more exciting than



**SCIENCE DIGEST**  
 "Where Fact is More Exciting Than Fiction"  
 Circulation: 530,000  
 Founded: (revamped) ca. 1980  
 Owner: Hearst Corporation

fiction"). The headline reads, "How to Make Nuclear War Obsolete." Provocative at a glance? Undoubtedly. But just *how* are we supposed to be able to accomplish such a feat? The article maintains that the answer lies in a dramatic technological fix, in this case the new breed of "smart warheads." The idea that a new breed of weapons will solve the problem of nuclear war is not just bad politics, it is bad science.

Such hyperbole is hardly limited to military-related pieces, however. Articles covering computer technology so often

fall prey to such a wide-eyed, promotional perspective that it is hard to find exceptions. While articles like: "Home Computer Power: Why You Need It," and "Shirk the Drudgery of 9 to 5 with your Personal Computer" abound, any type of analysis beyond a comparison of two competing models is hard to find.

Supplementing the coverage in the major popular science magazines is that found in the huge number of popular computer magazines that have sprung up within the past five years. While most articles like the above are clearly geared to help the consumer find his or her way through the vast array of new products, the absence of any substantive critical analysis about the real potentials and limitations of computer technology is nothing less than irresponsible. Discussion of the problems of limited access to computers for low-income people, or of the very real obstacles to successful teaching through computers is notice-

major particularly offensive types of claims made about scientific and technological "breakthroughs." One type is the claim which blatantly ignores the political realities which will inevitably shape the usage of the technology in question.

A powerful example of this first type of offensive coverage can be seen in an article on agricultural biotechnology published in the April 1983 *Science Digest*. The author, who teaches science writing at the college level, promotes agricultural biotechnology throughout the article in glowing terms: "Many of these genetic tricks, which were in the realm of sorcery only 10 years ago, appear attainable in the decades ahead because of several recent triumphs. . ." Triumphant though they may be, this particular author fails to devote even one sentence to the political realities of agricultural biotechnology.

Genetic engineering certainly holds tremendous potential in this field, but the corporate jockeying for ownership of the "supercrops" is already raising important fears of scientists and laypeople alike. Rather than simply laud the promise of "raising worldwide food production," this author would have done well to examine exactly who will benefit from such technology and why a rapid diffusion of this particular technology for

feeding the hungry of the Third World is highly unlikely and unrealistic.

The other type of offensive claim is that which is so taken by a particular example of technical mastery that perspective is lost of the ends to which such work is being put. A good example of this second type of offensive claims can be seen in an article from *Science '84* (published by the American Association for the Advancement of Science, as we are told, "to bridge the distance between science and citizen.") This article from last year covered the proposed new Trident-II missile, or as *Science '84* termed it, "the Next Superweapon." According to the author, these missiles are "both invulnerable and capable, at least in theory, of destroying every nuclear weapon on enemy soil within 15 minutes." Reporting like this should always raise questions. Is anything truly invulnerable? And what is the cost in human lives of this vast destruction of enemy nuclear weapons? While, in all fairness, the author does acknowledge some criticism of the new system, the main body of the article is devoted to a discussion of the increased accuracy of the new guidance system. The sophistication of this technology is undoubtedly cause for excitement, yet the glamorous portrayal seems to forget to what use this sophistication is going.

There is an unquestionable need for science journalists to chronicle the latest scientific and technological achievements; these achievements are also, quite understandably, the cause for a good deal of awe and wonderment. It is dismaying, however, to see how often such a perspective leads to simplistic and plainly biased reporting. There have been too many dashed promises and vested interests, too many environmental hazards and waste by-products to justify the type of rhetoric prevalent in much of today's popular science journalism.

We at SftP certainly realize that we are not above criticism ourselves, but hopefully the two types listed above will not come up often within these pages. Because of the dazzlingly large numbers of readers these magazines reach (each one alone has a circulation more than one hundred times as large as SftP), we feel all the more strongly the need for them to provide more critical analysis and less awe-struck, "star wars" science reporting. But until then, we at Science for the People will redouble our efforts. We know we have our work cut out for us. □

**DISCOVER**  
"America's Leading  
Newsmagazine of Science"  
Circulation: 878,000  
Founded: 1980  
Owner: Time, Inc.

ably lacking. Also absent is any coverage of the growing number of studies pointing to potential hazards from the low-level radiation that VDTs emit, hazards such as increased incidence of cataracts, skin rashes, and problem pregnancies.

Upon reviewing coverage of science and technology by the major popular science magazines, there seem to be two

**SCIENCE '84**  
"Bridging the Distance  
between Science and Citizen"  
Circulation: 700,000  
Founded: 1980  
Owner: AAAS

## Against the State of Nuclear Terror by Joel Kovel, South End Press, Boston, MA 1984

The Salvadoran military has collapsed. Robert D'Aubisson, alleged leader of the death squads in El Salvador, seizes power. With direct land and air support from U.S. troops, D'Aubisson unleashes his squads against the guerrillas. A foreign power announces that unless the United States agrees to a ceasefire and peace-talks, it will feel compelled to defend territory held by the guerrillas. Ronald Reagan, in turn, declares that should any foreign power intervene directly in this conflict, the U.S. may deploy battle-alert, nuclear-equipped stealth bombers along the borders of the would-be defender. The foreign power's ships and planes speed toward San Salvador ...

Many key leaders of the anti-nuclear movement in the United States continue to ignore the causes of war. The nuclear debate in this country has focused instead on weapons systems, arms reductions, deterrence, and star wars. But why do we have nuclear weapons? And what might be potential situations in which governments would feel tempted to use them? What are the causes of war?

Joel Kovel, a psychiatrist at the Albert Einstein College of Medicine, has written a provocative book that offers answers to these and other pertinent questions. In *Against the State of Nuclear Terror*, Kovel writes that "because our vision has been narrowed by psychologism ... we become absorbed in our reaction to the Bomb, and lose the connection with the state controlling the bomb." Kovel analyzes the link between nuclear weapons and the state apparatus which finds them to be a political necessity.

Kovel believes that nuclear weapons are the most dangerous symptom of a way of life where denial, rationalization, and projection of nuclear fears are all encouraged by the state that controls

these weapons. The result of this false pacification of the human spirit is an "inner bondage to the established order."

The "inner bondage" Kovel writes of is one of the most profound psychological effects of living under the threat of nuclear holocaust. Kovel urges people to confront their passivity and to focus their attention not on private feelings of despair, but rather on "the tendrils of the state ... pacify[ing] the psyche."

As many in the anti-nuclear movement shift their current focus to one more systematic and comprehensive, there will be an examination of "state nuclear terror" rather than nuclear weapons alone. This examination will explore "the influence of the world on the psyche."

Kovel is extremely critical of activists who ignore, in his view, the links between policies and the individual psyche. Especially criticized is Robert Jay Lifton, psychiatrist and author of *Death in Life* (the National Book Award-winning work on the psychological state of atomic bomb survivors in Hiroshima). Lifton developed the theory of "psychic numbing," defined as "diminished capacity or inclination to feel, to take into account the experience of what happens at the receiving end of the weapon." Kovel finds Lifton's "energy and persistence admirable," but then goes on to attack his work on grounds that it is "self-indulgent and ultimately nonsensical." Kovel's criticism stems from his conviction that Lifton's work is "a poor psychology, opaque to the great forces that actually move people in the world: self-interest, sexuality, and dependency on others." Kovel feels that Lifton has spent too much time attending to the bomb and not enough time "on the apparatus that uses the bomb."

"Until people can overcome their fear of the state," writes Kovel, "they cannot begin to meaningfully confront their fear of the bomb."

*Against the State of Nuclear Terror* is a systematic and structural analysis of the state behind the bomb. Kovel explores both foreign policies and domestic economic strategies of the United States in an effort to unravel the connections between these programs and the increasing threat of nuclear war. It is clear that the U.S. is preparing for war with the Soviet Union, for example, and that these preparations exacerbate world tensions. Equally clear are internal plans to create a capital-intensive economic structure in which power will be centralized in a cost-effective, yet secretive technocracy. These latter economic plans stir up unemployment and create domestic unrest. "It is possible," Kovel writes, "that economy may provide the subjective awareness to anchor the nuclear crisis in everyday life."

Despite his vigorous criticisms of things as they exist today, Kovel urges those opposed to nuclear weapons to offer "an affirmative vision of the future" that will be a "prefiguration" of better times. The anti-nuclear movement must offer an alternative program to that of the nuclear state, complete with its own set of values and goals. Included in this program, according to Kovel, must be anti-imperialism, economic conversion, and disarmament.

When members of the anti-nuclear movement are more willing to confront the causes of war, focusing energies on the state responsible for these tensions, opposition to a nuclear future will have a cohesion and political direction that is currently lacking. While this sequence of events may be difficult to imagine, Kovel believes that the alternatives are dangerous and incomplete.

"What is more enduring," Kovel asks, "the technical management of the arms race to keep it more or less at present levels, or the elimination of the causes of war?"

*Against the State of Nuclear Terror* is a provocative work that may help set the agenda for new directions of the anti-nuclear movement in this country. □

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## TOWARDS A DEMOCRATIC STRATEGY

continued from p. 11

same time sacrificing their newfound political independence.

It is relatively easy to identify, as I have tried to do above, the miscellaneous groups already engaged at one level or another in the struggle to create a more democratic politics of science. Expressing this strategy as a matrix also indicates the current gaps in this strategy, such as the lack of labor union activity around the democratization of scientific work (made all the more difficult by the relative weakness of labor unions within universities, as well as the highly competitive conditions in most laboratories, which act against any chance of collective action). The more difficult task is to see how these different groups will be able to weld themselves into a single political movement sufficiently powerful to mount a direct challenge to undemocratic policies introduced in the name of national efficiency. Given the common political nature of the issues each group is addressing — the concentration of power over science and its applications in the hands of a relatively small elite — coordinated action is necessary for the highest chance of success.

It would be wrong to pretend that there are any easy solutions. Equally, it would be wrong to adopt a fatalistic stance, accepting the advance of science and technology as inevitable, and the social destruction and authoritarian practices that they bring in their wake as the necessary by-products of progress. Science is one of the greatest cultural and intellectual achievements of the modern age. But its social significance must be placed in its proper perspective; it must not be seen as a key to utopia, a blueprint to a perfect future, or even the ultimate expression of human reason. Rather, science must remain firmly identified as a powerful tool that can help us to understand the natural universe in potentially useful ways, but at the same time carries the seeds of human exploitation. How to tap the one without falling victim to the other is the key challenge of the decades ahead. Creating the individuals and the political institutions through which this can be successfully achieved is the principal task now facing all those engaged in struggles over the new politics of science.

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# resources

## MEDIA

**Radical Media:** The Political Experience of Alternative Communication, by John Downing. South End Press, 302 Columbus Avenue, Boston, MA 02116, 1983, 275 pp., \$8.00.

**Mobilizing Media,** a national report on how the peace movement has used films and other media in grassroots organizing and education. Produced by Media Network, 208 West 13th Street, New York, NY 10011, (212) 620-0877, \$2.00

**As The World Really Turns:** Talking with Students about the Media. Compiled by the Cross-Cultural Communication Centre (CCCC) and the City Kid's Development Project. A series of critical readings on advertising, television, movies, popular fiction and popular music examining how these media may be used in the classroom. Available from the CCCC, 1991 Dufferin Street, Toronto, Ontario, Canada M6E 3P9, \$15.00.

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## BOOKS

**Facing the Danger,** Interviews with 20 Anti-Nuclear Activists, edited by Sam Totten and Martha Wescoat Totten. The Crossing Press, Trumansburg, NY 14886, 1984, 154 pp., \$8.95.

**Test-Tube Women, What Future for Motherhood?**, edited by Rita Arditti, Renate Duelli Klein and Shelley Minden. A collection of essays on current reproductive technologies and whether they really offer women greater freedom of choice. Published by Pandora Press, 9 Park Street, Boston, MA 02108, 1984, 456 pp., \$8.95.

**Watermelons Not War!** A Support Book for Parenting in the Nuclear Age, by Kate Cloud, Ellie Deegan, Alice Evans, Hayat Imam and Barbara Signer of the Nuclear Education Project. New Society Publishers, 4722 Baltimore Avenue, Philadelphia, PA 19143, 161 pp., \$9.95.

## RESOURCES FOR ACTIVISTS

**Fund for Open Information and Accountability (FOIA).** An organization founded to defend, enforce and strengthen the right of the public to know what the government is doing. FOIA publishes a quarterly magazine, *Our Right To Know*, as well as newsletter alerts when important things are happening in Congress. Publication is \$10.00 per year, available from FOIA, Inc., 339 Lafayette, New York, NY 10012.

**The Secret Agent** directed by Jacki Ochs, produced by Daniel Keller and Ochs. A 56-minute film scrutinizing the enormous costs of chemical warfare and nuclear technology. Shows actual footage of the Vietnam War along with interviews with members of both sides of the chemical warfare issue. Distributed by First Run Films.

**How Much is Enough?** Decision Making in the Nuclear Age, directed by Samuel R. Shore, edited by Joan Chaffee at Espresso Productions, Inc. A 16 mm, 58-minute film discussing ten issues in militarization and military policy. Rental fee: \$85.00 from Documerica Films, P.O. Box 315, Franklin Lakes, NJ 07417, (201) 891-8240.

## OCCUPATIONAL SAFETY AND HEALTH

**7th Annual Occupational Safety and Health Summer Institute,** August 6-10, 1984, Savannah, GA. Presented by the Occupational Safety and Health Educational Resource Center, Department of Environmental Science and Engineering, the University of North Carolina at Chapel Hill. For further information call (919) 962-2101.

**VDT News,** a bimonthly publication, covers health, safety and labor issues encountered by VDT users. Subscriptions are \$18.00 a year for individuals and \$35.00 per year for institutions. Send to: VDT News, P.O. Box 1799, Grand Central Station, New York, NY 10163.

**Cases in Bioethics** from the Hastings Center Report, edited by Carol Levine and Robert M. Veatch. Forty eight case studies of ethical issues encountered by doctors, patients and families. Published by the Hastings Center, 360 Broadway, Hastings-on-Hudson, NY 10706, 1984, 128 pp., \$9.95

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