

SCIENCE FOR THE PEOPLE

Those who profess to favor freedom, and yet depreciate agitation, are men who want crops without plowing up the ground... Power concedes nothing without a demand. It never did, and it never will. Find out just what people will submit to, and you have found out the exact amount of injustice and wrong which will be imposed upon them.

Frederick Douglass
August 4, 1857

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EDITORIAL PRACTICE

Science for the People is prepared and distributed through the efforts of three groups of our members, each taking responsibility for the editorial, production, and distribution functions respectively. Membership in these groups reflects a commitment to participate in magazine work for at least six months, up to a maximum of one year. The groups will be accountable to the general membership through open meetings called to discuss each issue and through criticism and comments received through the mail. In this way it is hoped that the magazine will present a more coherent political perspective, better reflecting the view of the larger organization. Nation-wide participation is strongly encouraged; interested individuals should contact the magazine coordinator at the Science for the People office. We also encourage preparation of single issues of the magazine by chapters outside of Boston, and point out that the separation of editorial and production functions should make this a more realistic task.

Every effort will be made to publish articles describing Science for the People activities. Analytical articles will be judged on the quality of their writing, and whether they reflect the general political outlook of Science for the People. The editorial committee may make minor changes, but any extensive rewriting will be carried out with the consent of the author. The editorial committee reserves the right to make editorial changes, or comments in italicized script, on all articles submitted. Authors should submit articles as double-spaced typed manuscripts; if possible, six copies are helpful. Contribution of drawings, cartoons, photographs, or designs on the topics of science, technology, energy, pollution, health care, the struggle against racism and sexism, imperialism, etc. are very welcome. For legal purposes, *Science for the People* is incorporated. *Science for the People* is available in microfilm from Xerox University Microfilms, 300 North Zeeb Rd., Ann Arbor, Mich. 48106, (313) 761-4700.

about this issue

This issue of *Science for the People* magazine goes to press as the American Association for the Advancement of Science (AAAS) finalizes preparations for its February 1976 meeting in Boston. The AAAS, as the largest and one of the most powerful organizations of scientists in the U.S., reflects the scientific establishment at large in its elitism and class nature. *Science for the People*, which started in Boston, has been active throughout the country in challenging the priorities, content and utilization of scientific research; these have historically been dictated by the capitalist class, with the cooperation of organizations like the AAAS.

One focus of our work has been to debunk the myth of the neutrality of science, widely believed by academicians. They call for academic freedom, while the military calls for a more advanced technology of destruction and counterinsurgency, longer-range and more-accurate missiles, new biological and psychological weapons. The capitalist class needs this technology to protect and extend its influence throughout the world, in order to obtain more resources and wider markets; thus it needs to direct the content of scientific research to its own ends.

One powerful mechanism of control has been the conscious organization of scientific work on a contractual basis. Two articles in this issue document the role that industry, the government and particularly the military have played in organizing and funding scientific research in this country. While they have obtained the needed information and technology, at the same time they have led the academic community to believe that scientific research is freely determined and politically neutral. We have attempted, through our experiences and the experience of others, to understand the political nature of scientific research; this has led to a more detailed critique of the ideological and scientific content of research, as well as its uses. We have criticized technological explanations and solutions for political problems, such as the attempts to find genetic causes for crime (studies of XYY males) and poverty (IQ and Herrnstein's meritocracy). Technological advances in such areas as agriculture and health care are intended to benefit agribusiness and the health-care industry, rather than to provide good food and adequate medical care. We have also criticized such spurious scientific theories as those proposed by the

continued on p. 46

POLITICAL THEME OF THE AAAS ACTIONS: THE CRISIS AND THE CLASS NATURE OF SCIENCE

The AAAS Coordinating Committee adopted the above theme to tie together the many activities at the February meetings of the AAAS in Boston. Our goal is to make all the activities part of one coherent blow.

Today, there is an economic crisis of the type that periodically occurs in capitalist economies. But it is intensified by the prolonged and extensive government funding of war and waste programs, by the increasing unity of the third world in resisting imperialist economic penetration, and by the intense rivalry between the two superpowers as they attempt to redivide the world. The severity of the crisis, and the growing resistance, among working people to taking the brunt of it in layoffs and lowered wages, has also precipitated recurring political crises ranging from exposures of corruption to the fiscal crises in the cities. Accompanying all this is the intensified social crisis as evidenced by the rise of crime in the cities, the growth of a fascist-like segregationist movement, and the anti-ERA, anti-abortion attacks on women's rights.

A crisis of such dimensions cannot but affect those attending the AAAS meetings. Some will be out of work or in fear of being laid off. There will be students graduating into unemployment, and others, especially minorities, whose education will be cut short by the cutbacks.

But the crisis also intensifies the class nature of science and technology itself. Since science always serves the class that rules, it is increasingly shaped, distorted, used and abused as the monopoly-capitalist ruling class brings to bear more and more of its resources to get out of the crisis and suppress the fight back. For example, as income spread increases, there is an increase and publicization of scientific rationalizations of the class structure of society. There are Wilson's "Sociobiology", Jenkin's and Herrnstein's theories of IQ, meritocracy and racial inferiority, and various later-day Spencerian theories of "the survival of the fittest."

*But, where there is repression, there is resistance; and, just as working people are fighting back, so also has *Science for the People* been fighting back against the ruling class use and abuse of science and technology. Every chapter and every activity group has been taking up concrete struggles against the intensified use of science and technology to load the crisis on the backs of working and other oppressed people.*

We encourage everyone to bring these ideas out as they participate in the actions at the AAAS:

- ... how the class nature of science is exposed and intensified by the crisis*
- ... how the struggle in a given area of science is but one aspect of the crisis of imperialism.*

AAAS: BICENTENNIAL AND BEYOND

Will the Future be as Bad as the Past?

"Science and Our Expectations: Bicentennial and Beyond" is the title of this year's AAAS convention. But what are our expectations? We see our cities falling apart, people thrown out of work, education and other vital social programs being cut back and the danger of war continually increasing. At the same time, people are struggling against these attacks on their standard of living. Workers are fighting back everywhere and there are many rent strikes, teachers' strikes, student demonstrations, and other actions.

And where is science in all of this? The health of this country is declining as huge amounts of money are being put into high-level medical technology while day-to-day problems of preventive medicine, diet and exercise are being ignored. Little attention is given to the problems of industrial health and safety as workers are being sped up and companies cut costs, leading to more accidents. Only a small amount of investigation is going into the effects of industrial pollutants even though it has been shown that they may be a major cause of cancer and other diseases. More and more research gets poured into developing new weapons and new methods of warfare, while other research and education in science gets cut back. While crime is running rampant because of economic deterioration, scientists are running around "proving" that crime is a genetic problem (XYY "research") and figuring out ways to "treat" it with drugs, behavior modification, and special screening to "weed out the bad kids." Meanwhile technology is being developed to aid police forces and government agencies in social control, e.g. new computerized information and communication systems — technology that can keep down the struggles of people for a better life. The reason for all of this is that the overall thrust of science in this country is not to serve the needs of people but to serve the needs of the ruling class — big businessmen, bankers, industrialists and corporate directors who run the economy on the basis of profits.

As we look through the program for the AAAS conference we see very little discussion of any of these questions. The convention consists of several public lectures and 180 panel discussions. The public lectures are the only times that any large number of participants are together. There is usually little or no time for discussion after these lectures. Although they cover several interest-

ing topics, such as "Mapping the Grand Canyon" and "Art of a New Scale," they do not deal with where science is going and how it can meet the real needs of the people.

The heart of the convention is the panel discussions. The participants choose, out of 180 sessions, the ones they are interested in. And the whole process is more like a supermarket of topics than an actual meeting or convention. But this supermarket is saturated with certain definite ideas about science. First of all, science is being glorified as an independent force grappling with such major social problems as health, energy, crime, and nutrition. There is very little discussion of military or corporate research and development. The government's science program is sold to the people at the conference and to the millions reading or hearing about it in the media as being more than worth the huge amounts of money the government is pouring into it. Secondly, the AAAS sessions put forward the idea that many of the problems in this country and around the world are technological problems and not political problems. For example, there are sessions on "Malnutrition, Behavior and Social Organization," and several sessions on crime ("Crime: What We Know and What We Need to Know," "The Anatomy of Violence in Today's Society") which, if they are anything like past AAAS sessions[1], will portray the problem of crime as one of individual deviation. By reducing these problems to technological questions, the real class conflicts underlying them are obscured. Finally, AAAS serves as a forum where representatives and apologists for the ruling class can speak directly to the scientists. For example, John C. Johnson, the director of an ordnance laboratory, will speak on "Putting Science to Work Through University/Industry Interaction," Andrew Brimmer[2] will speak on "Economic Equity . . . etc." Past AAAS conferences have featured similar speakers [3] Throughout these conferences science has been portrayed as a neutral, nonpolitical force.

Daniel Patrick Moynihan (presently U.N. ambassador from the U.S.), who was vice-president of the AAAS in 1971, even went so far as to cancel his talk when he heard that protestors would be there, saying that politics has no place in science [4] Moynihan, Urban Affairs advisor under the Nixon administration, is known for his "theory" that the condition of Blacks in this society is due to cultural characteristics of the Black family.

So, on the one hand, the convention does not ask whom science serves and why it is being used against people and not for the people. On the other hand, the convention as a whole serves the interests of the ruling class of this country by (1) persuading the public and scientists that the money going into science is being well spent; (2) consolidating scientists around government programs in science and convincing them that their work is in the public interest; (3) obscuring the underlying political causes of social problems by presenting them as technical problems; and (4) serving as a forum for reactionary politicians (e.g. Moynihan and Brimmer).

What Is the AAAS?

The AAAS (then called the American Association for the Promotion of Science) was formed in Philadelphia in 1848. It originally had less than 500 members; its purposes were to promote communication between scientists in different parts of the country and to "procure for the labours of scientific men increased facilities and a wider usefulness" [5].

Since it was founded, and to this day, AAAS has fought for more funds for science, worked to advance the status of scientists, and in general, looked out for the narrow self-interest of the scientific community. This can be seen today in the numerous editorials in *Science* magazine advocating that science be favored in the federal cutbacks and proposing more participation of scientists in government. But the role of science has changed dramatically since the AAAS was founded and so has the AAAS. During and after World War II, the government became much more involved in science. The atom bomb and radar, followed by guided missiles and satellites, all proved the enormous possibilities of science to the military. Scientific research became a necessity to keep militarily even with the Soviet Union. Tremendous amounts of money were infused into science through the military and through the "Sputnik"-era science programs.

At the same time, numerous military and government agencies were set up to make key decisions and set priorities about the direction of science [6]. (See the article by Carol Cina in this issue.) This created a hierarchy which penetrated every area of science. Those who move up in this hierarchy are those who advance science in the eyes of the people who control and fund it. The AAAS council is made up of delegates from affiliated professional societies which themselves are influenced by the government control of science. So it is not surprising that the members of the Board of Directors of the AAAS (chosen by the council) are almost all directors of government-funded laboratories, politicians, government advisors, or corporation men.

AAAS is also tied to the government and the ruling class by the income it gets from grants. Most of its activities, outside of *Science* magazine, are funded by government and foundation grants. For example, a large chunk of its "International Program" is funded by the

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THIS STRUGGLE MAY BE A MORAL ONE; OR
IT MAY BE A PHYSICAL ONE; OR IT MAY BE
BOTH MORAL AND PHYSICAL; BUT IT
MUST BE A STRUGGLE. POWER CON-
CEDES NOTHING WITHOUT A DEMAND.

IT NEVER DID, AND IT NEVER WILL. FIND
OUT JUST WHAT PEOPLE WILL SUBMIT
TO. AND YOU HAVE FOUND OUT THE
EXACT AMOUNT OF INJUSTICE AND WRONG
WHICH WILL BE IMPOSED UPON THEM; AND
THESE WILL CONTINUE UNTIL THEY ARE
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FREDERICK DOUGLASS
AUGUST 4, 1857

cpf

A.I.D. (State Department). In return, the government has sometimes used the AAAS to represent it at various international functions [7].

Within the AAAS structure, there has been some room (or even encouragement) for liberal programs. Notable are the AAAS studies of defoliation in Vietnam (released in 1972), and the AAAS minority programs, and the News and Comment section of *Science* which sometimes publishes articles about controversial topics in science. But upon closer examination, it seems that the defoliation study was held up for several years by the AAAS because it was waiting for the Pentagon's side of the story and by the time it was published, defoliation had already been thoroughly exposed. The AAAS minority projects have done little more than study the problems of minorities in science, while providing a public forum for such racist "scientists" as Moynihan and James Coleman [8]. And finally, the News and Comment section, which in some ways is a good column, is increasingly under attack. The new president of the AAAS says that this part of *Science* magazine is too "narrow" because it gives too many opinions and not enough "news." In fact he means that it doesn't report enough news from the government and industry [9].

There are many instances of the AAAS working in the interests of the corporate rulers of this country, but two in particular stand out:

First, in June of 1973, the AAAS held a two-week conference in Mexico City entitled: "Science and Man in the Americas". The AAAS issued no call for papers or proposals for this meeting, but selected various groups and individuals to participate. Most of the participants were from groups such as the Ford Foundation, the U.S. Department of Agriculture, A.D. Little Co., the World Bank and Coca-Cola. Five out of nine members of the planning committee were directors of major corporations with investments in Latin America. Ostensibly, the meeting was to help Latin American development, but session after session defined this as capitalist economic growth and ignored the basic problems of food distribution and imperialist domination. Overpopulation was often put forward as the major source of the people's problems. What the meeting was really for was to bring together scientists and businessmen, Mexican and American, to discuss the most profitable ways to exploit Latin America [10].

Second, in 1971, during the early days of Science for the People, four members of Science for the People wrote an article which was a critique of science under the American system of corporate capitalism and a description of the activities of Science for the People [11]. (Article available from Science for the People.) The article was submitted to *Science* and, in accordance with the customary procedure, was submitted to three referees chosen by the editor, Philip Abelson. Despite an unanimous decision for publication, the editor personally rejected the article for publication.

Science and Our Expectations

There are definitely hard times ahead for the people of this country. Everywhere people are being thrown out of work and the standard of living is being driven down. At the same time, the U.S. government is preparing for war. These problems do not have technological solutions. No amount of technology can stop the layoffs or the cut-backs or stop the rivalry between the U.S. and the Soviet Union. In order to solve these problems we need major changes in the system we live under. The key to these changes lies in the struggles of the people as they fight back against every type of exploitation and abuse at the hands of the profit-makers. But science is not a neutral force in this battle. While it has tremendous potential for building a better society and releasing human potential, it is currently oriented to the needs of those who rule. We can expect that as the economic crisis deepens, more science that really helps people will be cut back, while military and repressive technology will increase. In fact, the lack of jobs in science will bring pressure on scientists to embrace these new applications of science. There will also probably be a new burst of "theories" to place the blame for social problems on the people (such as racist theories of genetics and crime). We must accept a greater responsibility to expose these abuses of science and to build a social movement among scientists to resist the repressive uses of technology.

This is part of what the future holds. At the same time, we have another view of the future — a future with a society in which the great potential of science can really be harnessed to serve the broad masses of people rather than the profits of a few. And the struggles that are going on now are part of the fight to get there. We are coming to the AAAS as part of that struggle. We want to talk with people about the role of science in this society — about the uses of genetic theories to serve reactionary ideology, about why technology cannot eliminate crime in the streets, about how science is used for repression and war, and about how scientists can resist this direction and use their skills to aid the struggles of oppressed peoples.

What Are We Going to Do?

The scientific establishment, the government and the corporations behind it are the interests that have pulled together this year's AAAS conference. This is reflected in its program and in its co-chairmen, who are both corporate directors [12]. They have their own reasons for calling it. But we are going to it for different reasons. There will be many scientists and people interested in science at this conference. Many of those who come are interested in the social issues in science. Through our activities, our sessions, our meetings, literature, agitation, etc. we can raise political questions in a serious way. We can join with the scientists who are already dissatisfied with the direction of science and the uncertainty in their lives. We can learn from our discussions and mobilize even more people around these issues, and thus continue the struggle to make science for the people.

Frank Rosenthal

NOTES

1. *Science for the People*, Jan. 1973; *Science for the People*, Feb. 1971.
2. Brimmer is a member of the Federal Reserve Board, the Council on Foreign Relations, and is a past member of the S.E.C.
3. E.g. Daniel Moynihan, Hubert Humphrey, William P. Bundy.
4. *Science for the People*, March 1972.
5. *Science for the People*, Dec. 1970.
6. "From Corporate Liberalism to Counterinsurgency," by Carol Cina.
7. *Science Magazine*, March 21, 1975.
8. *Science for the People*, March, 1972.
9. *New York Times*, Jan. 2, 1976.
10. *Science for the People*, July 1973, *Science for the People*, Sept. 1973; see also *Por Que*, published by Science for the People.
11. This article has been issued as a pamphlet entitled "Censored," published by Science for the People.
12. The two co-chairmen are Gerhard D. Bleicken, chairman of the board of John Hancock Mutual Life Ins., and a director of A.D. Little and the First National Bank of Boston, and Howard W. Johnson, chairman of the MIT Corporation and director of John Hancock, Morgan Guaranty, Champion International, and a member of the Council on Foreign Relations.

SOCIOBIOLOGY: TOOL FOR SOCIAL OPPRESSION

Many of us in Science for the People have been involved in the struggles to expose the pseudo-genetic explanations for social and political problems, including the Jensen-Schockley-Herrnstein propaganda on IQ, genetics and race[1] and the myth of the XYY male[2,3]. We believe this work is very important because these theories are and have been used to oppress working people and minority groups and to spread an ideology which blames the victim of social and economic inequities for society's problems. The latest attempt to reinvigorate these biological-determinist theories comes with the alleged creation of a new discipline, sociobiology. This past summer we have been treated to a wave of publicity and laudatory reviews of E.O. Wilson's book, *Sociobiology, The New Synthesis** including a front-page *New York Times* article which stated:

Sociobiology carries with it the revolutionary implication that much of man's behavior toward his fellows . . . may be as much a product of evolution as is the structure of the hand or the size of the brain. (New York Times, May 28, 1975).

Yet, upon examination, these theories say nothing new, have no scientific basis and turn out to be merely a reflection of the social prejudices of the "sociobiologists." Their impact is to help support the *status quo*, and convince people that revolutionary changes in social relationships (e.g. class structure and sex roles) are impossible.

Recently, Science for the People groups in Boston and Ann Arbor have formed to analyze and combat this latest appearance of biological determinism. The Boston group prepared a critique which was published in the *New York Review of Books* (Nov. 13, 1974) and both groups are preparing articles for popular and academic journals. We are also examining a high school curriculum (*Exploring Human Nature*, put out by the Educational Development Center, Newton, Mass.), which is essentially a "sociobiology" text, organized by I. DeVore and R.

Trivers of Harvard University. Sociobiology courses are also being taught now at a number of universities and colleges. An article in the November, 1975, issue of the *American Biology Teacher* proclaimed the importance of sociobiology and recommended the setting up of sociobiology courses in high schools. As we have seen with other instances of biological determinist theories, the steps from academic journals to educational and public propaganda to social policy are very rapid. Sociobiology is not just an academic question.

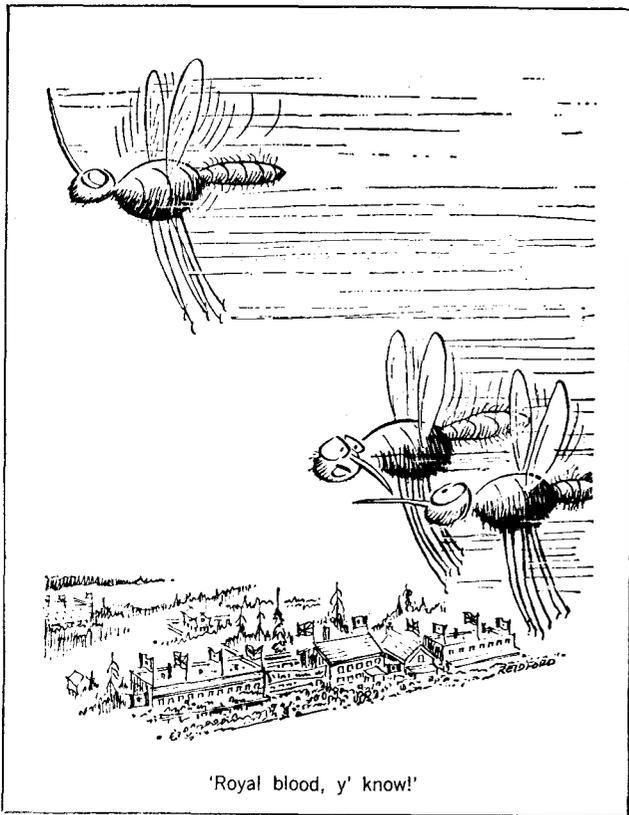
What follows are excerpts from the critiques we have written.

Historical Background

Beginning with Darwin's theories of natural selection 125 years ago, new biological and genetic information has played a significant role in the development of social and political policy. From Herbert Spencer, who coined the phrase "survival of the fittest," to Konrad Lorenz, Robert Ardrey and now E.O. Wilson, we have seen proclaimed the primacy of natural selection in determining most important characteristics of human behavior. These theories have resulted in a deterministic view of human societies and human action. Another form of this biological determinism appears in the claim that genetic theory and data can explain the origin of certain social problems, e.g. the suggestion by eugenicists, such as Davenport in the early twentieth century, that a host of examples of "deviant" behavior—criminality, alcoholism, etc. — are genetically based; or the more recent claims for a genetic basis of racial or class differences in intelligence by Arthur Jensen, Richard Herrnstein and others.

Each time these ideas have resurfaced, the claim has been made that they were based on new scientific information. Yet each time, even though strong scientific arguments have been presented to show the absurdity of these theories, they have not died. The reason for the survival of these recurrent determinist theories is that they consistently tend to provide a genetic justification of the *status quo* and of existing privileges of certain groups according to class, race or sex. Historically, powerful countries or ruling groups within them have drawn support for the maintenance or extension of their power from these products of the scientific community. For example, John D. Rockefeller said:

*Wilson, E.O. (1975) *Sociobiology: The New Synthesis*, Harvard University Press, Cambridge.



'Royal blood, y' know!'

The growth of a large business is merely a survival of the fittest. . . The American Beauty rose can be produced in the splendor and fragrance which bring cheer to its beholder only by sacrificing the early buds which grow up around it. This is not an evil tendency in business. It is merely the working-out of a law of nature and a law of God.'[4]

These theories provided an important basis for the enactment of sterilization laws and restrictive immigration laws by the United States between 1910 and 1930, and also for the eugenics policies which led to the establishment of gas chambers in Nazi Germany.

A Critique of Sociobiology

In our view, the major arguments of sociobiologists about human nature, as represented in Wilson's book, are unsupported and politically reactionary in their implications. The premises are that:

1. All human societies share certain kinds of human behavior, which together can be considered to be our "human nature."

2. These behaviors, this "human nature," are mainly the result of specific genes, and thus of evolutionary adaptation. The major sources are not to be found in cultural evolution or political and economic conditions.

On what basis does E.O. Wilson draw his conclusions? Most of his book is a review of massive amounts of published data on ant, bee, bird and primate behavior. In brief final paragraphs to three chapters on animal behavior and in his introductory and final chapters he implies that these data on the apparent genetic programming of animals lead to similar conclusions about human behavior.

. . . a single strong thread does indeed run from the conduct of termite colonies and turkey brotherhoods to the social behavior of man(p. 129)

In his first and last chapters, Wilson names specific "basic mechanisms of human nature: aggression, allegiance, love, sexual drives, xenophobia." Elsewhere, he adds to the list — male dominance, sex-role division of labor, mother-child bond, parent-child conflicts, altruism, spite, indoctrinability, military discipline, territoriality and even genocide.

Wilson declares these traits are universal, even though anthropological data points to the exact opposite — to extreme variability of behavior among human societies. He has a variety of loopholes to explain the societies he admits do not show his universal traits. The societies which do not seem genocidal, Wilson says, have simply "reverted temporarily to the pacific state." Other societies which he admits "show no territoriality at all," will still fit his scheme if we "define territory more broadly." In fact, Wilson's list of universal traits looks more like a description of human behavior in modern industrial society than a comprehensive view of human nature. For Wilson, our own society's sex roles, aggression, military discipline, etc. are natural. What exists for North Americans today he has rationalized to be universal and innate.

Once Wilson has established in the reader's mind that indoctrinability, spite, etc. are universal traits he tries to prove that these traits have a genetic rather than a cultural or social-political basis. He uses four methods, none of them logically sound.

1) Wilson reviews massive amounts of data on animal behavior, then reasons that since humans are anatomically analogous to some animals, our behavior can be interpreted in the same way as the presumed genetically programmed animal behavior. This reasoning confuses analogy (similarity of function) with homology (similarity of structure and origin). Just because we have descended from animals does not mean that our behavior has developed in the same way. Just because two actions appear similar, their interpretations are not necessarily the same. Geese "dance" on occasion; people perform Swan Lake on occasion. Since the first is explained as a mating ritual, must the second have the same explanation?

2) Wilson attempts to strengthen the links between animal and human societies by using metaphors from

human societies to describe characteristics of animal societies. For instance, in insect populations, Wilson applies the traditional metaphors of "slavery" and "caste", "specialists" and "generalists" and "elites" in order to establish a descriptive framework. Thus, he promotes the similarity between human and animal societies and leads one to believe that behavior patterns in the two have the same basis. Oppressive institutions seen in human societies are made to seem natural because of their "universal" existence in the animal kingdom. But metaphor is no substitute for logical connections.

3) Wilson also establishes specific genes for various human social behaviors by simply stating them to be true, without providing any data:

Human beings are absurdly easy to indoctrinate — they seek it. True spite is commonplace in human societies.

These statements are Wilson's entire "proof" for the existence of "spite genes" and "conformer genes."

4) Once Wilson has deemed conformity, spite, etc. universal traits and has claimed a genetic basis for them, he goes on to explain how each trait is adaptive. Spite, for example, acts to increase a person's ability to survive and to reproduce. Altruism or heterosexuality act to increase a person's family's ability to survive and reproduce. His model is infinitely elastic; if we act selfishly, that is individual selection at work; if we act altruistically that is kin selection — everything fits.

And what of counterexamples? Wilson himself calls xenophobia and territoriality maladaptive in today's world. But again, he creates a loophole: these traits were once adaptive but have stopped evolving, therefore, becoming liabilities. Again, he manages it so that exceptions can only serve to prove the rule.

The Implications of Sociobiology

Where is Wilson going with these arguments? He has taken human behavior in modern industrialized society, as he sees it, and by analogy to animal behavior, by irresponsible use of language, and elastic arguments, he has portrayed this behavior as universal, genetic, adaptive "human nature." The political implications are clear. For if our behavior is genetically determined, then efforts to alleviate social problems resulting from that behavior must fail. Genes are beyond our control.

The perfect society, one which lacks conflict and which acts with complete altruism and cooperation is possible only when all members are genetically identical. (from an interview with Wilson in People Magazine)

We are no longer responsible for our behavior, and for changing it if it is destructive or oppressive to others. In

fact, according to Wilson, deliberate social change could be biologically dangerous.

Complete honesty on all sides is not the answer. The old primate frankness would destroy the delicate fabric of social life. (p. 553)

If the planned society were to deliberately steer its members past those stresses and conflicts that once gave the destructive phenotypes their darwinian edge, the other phenotypes (cooperativeness, creativeness, etc.) might dwindle with them. (p. 575)

Occasionally, Wilson attempts to include disclaimers for any implications to his conclusions. For example, in a recent article in the N.Y. Times Sunday Magazine (Oct. 12, 1975), he states concerning division of labor between the sexes:

This strong bias persists in most agricultural and industrial societies and, on that ground alone, appears to have a genetic origin. . . My own guess is that the genetic basis is intense enough to cause a substantial division of labor even in the most free and most egalitarian of future societies. . .

But then he tries to deny the implications of these statements:

But this is only a guess, and, even, if correct, could not be used to argue for anything less than sex blind admission and free personal choice.

Isn't this like constructing a hydrogen bomb and then stating that you never meant for it to be used?

While Wilson attempts to dissociate himself from the more popular determinist writers, such as Ardrey, Lorenz, Tiger and Fox, by accusing them of employing the "advocacy" method, we believe that his approach and his conclusions put him in the same camp. All would have us believe that our behavior is biologically determined and therefore immutable. All rest their conclusions on an implicit political conception of the proper social order. In so doing they turn us away from the true causes and valid solutions to social problems.

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Sociobiology Study Group

GENE IMPLANTATION: HAZARDS OF GENETIC ENGINEERING

Recent breakthroughs in the field of genetics have improved greatly our understanding of how genes carry information from one generation to the next, and how they specify the development and functions of all organisms. Associated with this new knowledge are powerful new technologies which allow the linking of genes from one organism to the next. In particular, molecular geneticists have utilized newly characterized "restriction enzymes" to couple genes from various living organisms to the ubiquitous intestinal bacterium, *E. coli*. Theoretically any organism could act as recipient for such gene implants. Bacteria are now being used because they permit easy, critical measurement of the technique's success. However, the practitioners of gene implantations have recently been subjected to questions[1, 2] from both in and out of the scientific community about not only what they hope to achieve, but also if and how their experiments should be conducted.

The ultimate justification offered for these experiments is the possibility of altering human genes. For example certain rare genetic defects such as hemophilia, thalassemia, sickle-cell anemia, and alkaptonuria might be correctable by genetic "surgery". We will not discuss in this article the virtues or dangers of such eugenic theories.[3] Rather we focus on the public health hazards of creating unnaturally altered organisms. Though few of us would be potential candidates for gene implants, all of us are subject to the risks involved. We certainly should assess the risks involved, and we should spend an adequate amount of time doing it. The social benefits of gene-implantation work which may arise will be of equal value whether they arrive in 20 versus 25 years, or 100 versus 105 years. For five or ten years now a slow, thoughtful research-based approach to limit the hazards makes sense.

Before describing the dangers, it is worth reviewing the form that the controversy has taken. A small group of molecular-biology research directors addressed a letter to the scientific community and explicitly asked that all research on "recombinant-DNA" molecules (gene implantations) stop until the risks involved and safeguards necessary to conduct the research were evaluated for this. These scientists, who have proclaimed only the potential rewards of such experiments, have now been heralded by the media for what is deemed to have been an unprecedented event in the history of science.[4]

A group consisting essentially entirely of research directors was expressly invited to attend a meeting at Asilomar in California where these questions were discussed. A resolution representing the consensus of the meeting was adopted, calling for the establishment of a committee under the auspices of the National Institutes of Health. This committee was empowered to draw up a system of biological-containment procedures and recombinant-DNA recipients which could be assigned to any experiment whatsoever.

The committee that was appointed consisted of fifteen biomedical-research directors. Both the composition of the committee as well as the guidelines they adopted were criticized by the Genetics and Social Policy group of Science for the People, among others, for violating the spirit of the Asilomar meeting.[5] As a result the committee was instructed to reexamine original guidelines and resubmit specific proposals.

Finally on December 4 and 5, 1975, the committee adopted a set of guidelines which will in all likelihood be the working guideline.

The moratorium on active research, consideration of the risks involved, and establishment of guidelines for such research which others have dubbed unprecedented, are considered by the Genetics and Social Policy Group of Science for the People to be publicly misleading. Such actions appear to have been taken to ensure the welfare of the general public, yet the public was neither informed, consulted, nor educated. The research directors have a vested interest and involvement in their own experiments. Can they be counted on to take full responsibility? If these experiments were to be put on trial, why then were the experimenters allowed to act as prosecutor, judge, and jury? The progress of dangerous gene-implantation experiments has suffered inconveniences but has not been deterred.

In their zeal to answer fascinating scientific questions, the research directors failed to open debate. Experts in related fields such as epidemiology and public health, occupational health and safety, and microbial ecology, who might have contributed to discussions of dangers inherent in such experiments, were not consulted. Neither were the laboratory workers, who actually perform the experiments, allowed to participate despite the fact that they are exposed to the greatest risks. The general public, neither informed nor consulted, is also exposed to the

risks involved in recombinant-DNA experiments and should not abnegate responsibility. And it is precisely because such experiments are being conducted in the public interest with public money that the public should be educated about the pros and not deluded about the cons. Substances such as radium, asbestos, thalidomide, vinyl chloride, and dieldrin which appeared completely beneficial at the time of their introduction have become intentionally or accidentally destructive of human life and the environment. Today, molecular biologists are in a position to benefit from the lessons of our technological present and not to contribute to the inventory of tragic results of the past.

A large question mark in gene implantation is that the common bacterium of the human intestine and throat, *E. coli*, acts as recipient for all newly transplanted genes. The practitioners maintain that: (1) the containment apparatus will not allow the escape of the implanted bacteria into the environment, (2) even if some escape, they have been so extensively crippled that they are unable to persist outside the laboratory, and (3) these bacteria are unable to exchange genes with other bacteria as normally occurs, so that the implanted genes cannot be transferred to healthy bacteria. These ideas are supported by research into the genetics of bacteria at the molecular level, but the Genetics and Social Policy group feels the dangers are sufficient to warrant extensive tests to insure that unwanted, foreign genes don't end up in the bowels of unsuspecting passers-by.

It has been assumed that these physical-containment facilities will be adequate although there has been no mention of thoroughly testing them before the more dangerous experiments are attempted. In fact the number of reported acquired infections in laboratories with special containment facilities have been around 1650 in the last 30 years. There have been 423 cases of infection and 3 deaths in 25 years at the U.S. Army Biological Laboratories at Ft. Detrick, Maryland, alone.

Even if the bacteria employed to receive the gene implants are crippled as required, there remains a finite possibility that they may persist outside of the laboratory. Cultures of crippled bacteria ready to receive gene implants may readily be contaminated with healthy bacteria. These healthy bacteria, containing gene implants, may readily spread to the environment. Although such events are unlikely, over many years they may become a distinct probability. *E. coli* have been chosen because of convenience to the experimenters, not because of public safety. Another bacterial recipient could be developed which is much further removed from the human biosphere. If the committee truly had the interests of the public at heart it would have insisted on a bacterial recipient that was humanly remote. The cold fact remains that the proposed safeguards have not been validated. In view of these uncertainties it would seem safe and prudent to proceed with what are generally agreed to be the less dangerous implants. However as the guidelines now stand virtually any recombinant-DNA experiment can be performed.

What then are the real dangers of these artificially constructed bacteria? The answer is somewhat rhetorical as well: we don't really know. This alone should be cause for trepidation. It would be easy to construct horror stories about bacteria gone berserk, or powerful biological toxins implanted into the genes of ubiquitous human-inhabiting bacteria thus constructing novel biological bombs, etc. For every fairy tale which ends with, "and they lived happily ever after," an equally disastrous scenario can be painted.

It would be highly desirable to construct a bacterium in which the gene for insulin biosynthesis had been implanted. Such bacteria could supply insulin cheaply in virtually unlimited amounts. However insulin in greater than minute amounts is a deadly poison, and were *E. coli* harboring an active gene for insulin biosynthesis to gain admittance to human intestinal tracts the results would swiftly be fatal. Here then is a highly desirable candidate for gene implants, all the more so being a potential financial boon, which could easily have undesirable consequences. The pharmaceutical industry would be extremely interested in constructing an insulin-producing bacterium. However, containment problems on a large industrial scale are compounded enormously. Historically the health and safety of the American worker have not been of prime concern to American industry, nor in academic scientific circles for that matter. Will it be possible to maintain a low level of risk in large-scale industrial operation? Who will write and enforce the guidelines? The NIH guidelines apply only to academic research, yet private industry stands to profit greatly. The stresses involved in maintaining safe containment conditions openly tempt flagrant violations.



Electron micrograph of human chromosome 12.

Therefore all workers, academic or industrial, potentially exposed to hazards of gene implants ought to be organized to both educate and protect themselves. Local safety committees, like the new Biology Health and Safety Committee at MIT, should be organized and should include lab technicians, custodial people and clerical workers. The formation of such committees is mandated by the NIH guidelines themselves. However, unless workers organize themselves actively these committees will be composed entirely of research directors, who have little or no interest in safety. It is up to each and every one of us to insure that our rights are observed.

Decisions about which research projects should be pursued are matters of public policy, and the general public must become involved. These are financed by public tax money, spent for public welfare, and all of us have a right to a say-so. Senator Kennedy of Massachusetts is convening a public meeting of the Senate Health Subcommittee on Genetic Research and Bioethics which will hopefully discuss and propose legislation aimed at precisely these questions. The Genetics and Social Policy Group of Science for the People hopes the American taxpayer gets a fair hearing at this conference, and that in the future all such public-welfare decisions cease to be open to only ranking professionals in their exclusive fields.

The Genetics and Social Policy Group notes the irony of the current situation. In the name of improving human health, newer and more potent threats to human health are being developed. It is unclear that these genetic technologies have been developed in response to national needs or whether they are simply the interests of professional scientists who make their livings with such developments.

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IN THE LAND WHERE COCA COLA IS QUEEN

'Food additives are like friends. We need and depend on them but often take them for granted.'[1]

We have taken the above quote on food additives from a recently published book called *Panic in the Pantry*, co-authored by Frederick J. Stare and Elizabeth M. Whelan. Criticisms voiced by nutrition activists have been so widespread and clamorous in recent years they made necessary the apologetic response in this book. Stare condones the addition to foods of cyclamates, DES[2], and sugar while warning against overconsumption of peanuts, yogurt, and wheat germ. Of course there are natural toxins in many foods and our bodies are probably capable of detoxifying large numbers of trace poisons naturally found in foods, but to increase deliberately the amount of poisons in one's diet with artificial and potentially dangerous additives seems ludicrous to us. Stare also claims that natural fertilizers

are no different from artificial fertilizers and that food grown on chemically supplemented soil does not differ in its nutritional qualities from organically grown food. He forgets about trace minerals (eg: zinc, manganese) which have been recognized only recently as essential in our diets. Plants grown on soil lacking trace minerals will not provide us with what we need to thrive.

Stare defends on behalf of the manufacturers the Terrible Ten, the list of foods which Michael Jacobsen of the CSPI (Center for Science in the Public Interest) listed as representative of the food industry's worst efforts (See Table). Stare claims "these foods, like *all* foods available today, when used in moderation and in the context of a well-balanced diet, *contribute* (his italics) to both our physical and psychological well-being." [3] It should be good news to Dr. Stare that sometime during this year, soft drinks will replace coffee as America's favorite drink.[4]

Frederick Stare is chairman of the Department of Nutrition at Harvard University. He has received increas-

THE TERRIBLE TEN

Wonder Bread	<i>fact</i> made by ITT, costs 30% more than other white breads; squeeably fresh forever and nutritionally inert
bacon	contains nitrites which become nitrosamines which are carcinogenic
sugar*	contributes to health problems: diabetes, tooth decay, heart disease
Gerber baby food dessert*	water is prime ingredient, plus sugar laden
Frute Brute*	breakfast cereal, 40% sugar, costs \$1.40/pound
Breakfast squares*	main ingredients are sugar and fat whose undesirable effects are not canceled out by the added vitamins and minerals
prime grade beef	high in fat, high in cholesterol, fattened in feed lots on grains
table grapes	UFW boycott
Pringles	the ultimate insult to the potato
Coca-cola*	contains no nutrients and has 9 teaspoons of sugar; costs more than milk

*The per capita consumption of sugar by Americans is 2 pounds per week.

ing financial assistance for his research from the Nutrition Foundation which Stare himself had a major role in organizing (he is editor of their publication *Nutrition reviews*). The Nutrition Foundation, founded in 1941, is supported by the largest food processors and refiners in America. "The listing of its Board of Trustees reads like 'who's who in food.'" [5] Many of the research projects at universities and elsewhere, such as those Stare quotes as evidence for his attack in his book, are funded by the Nutrition Foundation as well as by the Sugar Research Foundation, the National Dairy Council, and by food companies themselves such as General Foods. Stare himself receives for research more than \$200,000 yearly from the food industry.[6] It is little wonder that Stare thinks sugar is a wonderful food! It is also no surprise that when the Consumer's Subcommittee of the Senate Commerce Committee heard testimony in 1970 on the state of the American diet Stare testified how good and nutritious breakfast cereals were. Elizabeth Whelan (his co-author) had done her graduate work under Stare at Harvard and is now a writer and researcher in public health.



"No American in his right mind would advocate putting a cancer-causing agent in the food supply." [7]

In this way, Stare lightly dismisses as unnecessary the Delaney clause (part of the 1958 Food Additives Amendment to the Federal Food, Drug, and Cosmetics Act of 1938. The Delaney clause states that any additive which is found to induce cancer when ingested by man or animal must be removed from the market.). He points out that small amounts of carcinogens exist naturally in a great number of foods from apricots to saffras. His description of Food and Drug Administration (FDA) action banning the dye Violet I from foods is so colorful that we will summarize it for you.

Stare says he is confused that the FDA banned Violet I because of one single research project after it had been used without question for 22 years to mark the grades of meats. He claims to be puzzled that remaining Violet I products were allowed to stay on shelves, and that the FDA is now retesting the coloring and may allow it to be rought back. In the meantime, Reds # 2, 3, and 40 and Blues #1 and 2 are mixed to get the violet color to stamp meat.[8] Stare sees all this as ridiculous. We are not confused and want to explain to him why such situations recur time and again.

A few publicized cases such as the banning of cyclamates in 1969 (which, it has just been announced, will be coming back into our foods) have given the general public a feeling of security that the FDA is looking out for their interests. Such confidence in this government regulatory agency proves unwarranted. For

one thing, it is the manufacturers and not the FDA which test new food additives and it is the same manufacturers which generally decide what constitutes adequate scientific evidence. After a manufacturer submits to the FDA a petition for approving the introduction of a new additive, the testing evidence in the petition becomes confidential and is not available to the public. It is not simply a question of the FDA doing its own test (as it did when it retested Violet I after 22 years of use) or of insisting that the manufacturers do more stringent testing. The important question to ask about the FDA is to whom does it owe its loyalties. The answer is that the FDA is loyal, not to the consuming public, but to the food manufacturers themselves. The FDA considers additives or any chemical safe until proven guilty. That is fine in a legal defense of a person but such risks should not be taken with our well-being.

We cannot resist mentioning, in passing, some of the food industry's ties with governmental agencies. Virgil Wodicka, director of the FDA Bureau of Foods until 1974, previously worked for the Quartermaster Corps, Ralston Purina, Libby, McNeil, and Libby, and Hunt-Wesson.[9] He is now a private consultant for industry.

Peter Hutt, General Counsel for the FDA, who with Frederick Stare condemns the Delaney clause, previous to his FDA appointment vigorously represented corporate interests in food-and-drug-law cases. Hutt represented, among others, Continental Baking [ITT], the Cosmetic Toiletry and Fragrance Association, the Institute of Shortening and Edible Oils, Carnation Company, and the National Association of Chewing Gum Manufacturers.[10]

FDA employees, after leaving their governmental positions, often can expect an industry position (the deferred bribe). And so to return to Stare, "We have indeed been fortunate, in the past and currently, in having FDA commissioners who are intelligent, professionally trained, reasonable, dedicated, and apolitical individuals — the very type we should have in top regulatory roles." [11]

The AAAS and Food

As chairman of the Department of Nutrition of Harvard University, Frederick Stare has often been a prime establishment spokesman on matters of food. Establishment academics have been used traditionally as apologists for American food corporations and as theoreticians for governmental food policy. The AAAS, long a reflection of the major interests in academic research, considers food a major concern. They devoted an entire issue of *Science* to food (May 9, 1975) and for the upcoming annual conference in Boston, a significant number of sessions will address food issues. Stare was chosen by the AAAS to moderate, in part, a three-day AAAS conference "The Food Dilemma: It's no Picnic" this past November at the Museum of Science and the Public Library in Boston as a preliminary discussion forum to the February conference.

The articles in the May 9, 1975 issue of *Science* (devoted entirely to food) range over a variety of topics from

agricultural research to governmental policy and international nutrition. The articles show some realization of the interaction of politics and economics in the present world patterns of food distribution (two articles deal with food production in India and China). There is little or no interest, however, in changing existing social structures toward an equitable distribution. Rather, solutions dependent on the heavy use of sophisticated technology are proposed (e.g. computer programming to anticipate future needs for famine relief). Further, most articles take for granted that the cessation of population growth must occur. The authors may believe that they are tackling the roots of world hunger, but they are only studying the symptoms. The authors who contributed these articles to the AAAS are either university academics (such as Jean Mayer of Harvard) with positions in prestigious agronomy or nutrition departments or members of superinstitutes and planning centers.

Everyone that the AAAS presents at its conference will not be as reactionary as Frederick Stare. It seems when reviewing the agenda that the AAAS has scheduled a broad spectrum of political views, but one must be wary of the powerful influences behind certain speakers. As a counterbalance to the usual AAAS sessions there will be a full-day session arranged by George Salzman of Science for the People: "Energy and Food Production: Contemporary Technology and Alternatives." We hope that alternative views are expressed at all sessions about food and that food not be dealt with solely as a neutral issue. Food has become a growing political tool and we must see that it is used for the people. Many nutrition activists groups [12] exist in Boston as well as in other cities and it is our hope not only that their influence be felt by all the Stares in all the pantries, but that they serve as a core for organizing people around that very political issue: food.

Connie Phillips Sue Tafler

NOTES

1. Frederick J. Stare and Elizabeth M. Whelan, *Panic in the Pantry*, Atheneum, New York, 1975. Page 106.
2. There is strong evidence that diethyl stilbesterol (DES), which is a steroid hormone fed to cattle to make them grow fatter, causes cancer in humans.
3. Stare and Whelan, *op. cit.*, page 15.
4. *Boston Globe*, December 20, 1975.
5. Beatrice Trum Hunter, *Consumer Beware!*, Bantam Books, New York, 1971, page 19.
6. *Ibid.*
7. Stare and Whelan, *op. cit.*, page 139.
8. Red #2 is a highly controversial (and potentially dangerous) additive.
9. Catherine Lerza and Michael Jacobsen, eds., *Food for People not for Profit: A Source Book on the Food Crisis*, Ballantine Books, New York, 1975.
10. *Ibid.*
11. Stare and Whelan, *op. cit.*, page 187.
12. FOOD DAY, an off-shoot of DSPI, is organizing a national day of concern on April 8, 1976. They will organize and educate people in the struggle to regain control of their food. For the Boston area, contact Connie Phillips, c/o Science for the People, 16 Union Square, Somerville. The national office of FOOD DAY is 1785 Massachusetts Avenue NW, Washington D.C. 20036.

AGRIBUSINESS: FEEDING PROFIT RATHER THAN PEOPLE

The most surprising fact about agriculture today is that sometimes people have enough food, that hunger is not more widespread than it is. This is surprising because in most of the world today, food production is not undertaken to feed people, food does not flow from well-fed areas to hungry areas; nor do fluctuations in food production follow changing needs. The problem of hunger in the world today is not the result of too many people or of an unsuccessful effort to feed people, but of a pattern of resource use, population movement, agriculture, and research that is essentially independent of peoples' needs.

What follows is an outline of our views on agriculture with some specific examples. Our intent is not to document all cases relevant to our points, but rather to emphasize the pervasiveness and extent of the social and economic costs to the many, for the benefit of a few, which results from the motives and practices of "modern" agriculture.

1. Food production is for profit and power rather than to feed people.

Agriculture in much of the world is production not for food, but for commodities to sell. The choices of crops, markets, and technology are dictated by considerations of profitability rather than need. This is especially true when the agricultural system is under foreign control, especially by imperialist countries like the U.S. Then the diversion of land from production for local use and sale, to production for export, has rapidly increased hunger: e.g. in Brazil blackbeans, a major food item, has been displaced by soybeans for export, and cash crops, mostly peanuts, have encroached on the grazing lands of the Sahel.

What is planted and how much control farmers have over food surpluses have long been used as political weapons. In 1918, Herbert Hoover used his control over postwar famine relief to starve out the Hungarian Soviet Republic. After World War II, the United Nations Relief and Rehabilitation Administration distributed food without regard to political system. But the U.S. caused the demise of this program in 1947 so that unilateral aid by the U.S. could be a weapon in the cold

war. The current "Green Revolution" not only makes world agriculture dependent on U.S. science and technology, it strengthens the rural bourgeoisie and is a consciously used weapon against revolutionary upsurge. In the case of India, Hari Sharma has shown how the wealthy landowners have used the Green Revolution to their own ends, not for feeding people better, but rather to increase their own wealth at the expense of the laborers.[1]

2. Economic institutions support "modern" agriculture, benefit big business, and are organized to increase profit.

Despite dramatic increases in crop yields and food prices in recent years, most farmers in the U.S. are facing decreasing returns for their investments. In 1945 farmers averaged \$1000 net income for every \$1000 production expenses; in 1975 they made only \$400 (not corrected for inflation!). Of course this average presents a distorted view of the situation since the existence of a very few highly successful enterprises hides the fact that most farmers are doing far worse. The rapid migration from rural to urban areas (see below) is evidence of the fact that most farmers are facing increasingly hard times. Among the factors which contribute to this situation are the rapidly increasing costs of agricultural inputs and the increasing share of the food dollar which goes to food-processing and food-distributing companies.

In the U.S., as well as in many other countries, banks and credit agencies often require that their clients plant only specific crops and use capital-intensive methods, emphasizing cash crops, chemical fertilizers and pesticides, heavy machines and High Yield Varieties (HYV). For example, in the Philippines, in order to qualify for land redistribution under "agrarian reform" and to receive government credit, a farmer must agree to use the "Green Revolution" package: HYV seeds and chemical supports.

In Third-World countries, attempts by international institutes and local governments to increase agricultural productivity are made to insure the development of capitalist relations in the agricultural sector and to improve their balance-of-payments situation, not to insure that the masses of the people eat better.

3. Agriculture for profit affects peoples' lives in the most basic and dramatic ways.

Farmers and consumers have lost control over the kinds of food grown, how it is grown, harvested and processed, and the prices at which it is marketed. This means that people are being displaced from their very existence as farmers by the crush of large capital-intensive farming and the market restrictions of profit production. Rural communities are disrupted and sometimes obliterated as people migrate to cities in search of work. In the US since 1940, 30 million people have moved to urban centers. There is still a migration rate of 800,000 people per year leaving their farms.[2] Many displaced farm families are compelled to resort to welfare. In the numerous countries without welfare, many, many people starve.

In many agrarian societies, numerous social and economic organizations have been destroyed by imperialism in the agricultural sector. For example, in much of Africa, women traditionally performed most of the agricultural work and provided the economic support for their families. The European colonialists objected to women doing "men's work" so they employed only men on their plantations and farms. Later when agricultural extension services were established, agents taught only the men and encouraged them to take over farming responsibilities despite the fact that the women were historically the agriculturalists. Thus the family structure was disrupted and the economic independence of women was seriously undermined.

The effects of capitalist agriculture reach us every day. The food we eat is often loaded with harmful chemicals such as dyes, ripeners, and the residues from expensive pesticides and fertilizers used in the growing process. The social cost in terms of good health and well-being is virtually inestimable.

4. Agricultural technology and practices are dictated by considerations of profit rather than of human welfare.

In many parts of the world including the U.S. and Latin America, food producers get most of their technical advice from representatives of companies which produce agricultural inputs, e.g. machinery, chemical, seeds. These companies are primarily geared to serve and advise capital-intensive producers, who in turn supply most of the raw materials to food-processing and distributing enterprises. Together the input producers and food processors, with the assistance of government agencies like AID have created the myth that "modern" agriculture means using the technology and practices now being developed in the U.S., and that this kind of agriculture is necessary for "development." In fact, though, this technology has been developed to maximize the profits and/or convenience of three commercial interests: agricultural-supply companies, capital-intensive producers, and food processors and distributors.

Until very recently, little thought has been given to the nutritive value of the food produced or to the effect of the technology on the environment. Thus, for several years

cattle producers have been using diethylstilbestrol (DES), to fatten their stock quickly in feedlots, even though DES is a potent carcinogen. Plants have been developed to maximize profits through very high yields; it is no coincidence that these plants require very heavy treatments with chemical fertilizers and pesticides in order to realize their potential. But these new practices are undermining our safety: agricultural workers are being poisoned by pesticides, nitrate fertilizers are contributing to the formation of highly carcinogenic nitrosamines, waterways and fisheries are being contaminated by both fertilizer and pesticide runoffs, etc.

Finally, indiscriminate mechanization is causing further environmental problems in many places by causing erosion and loss of soil fertility. Mechanization, together with other requirements of the "modern" system, actually determines the types and arrangements of plants which farmers can grow. Cotton plants have been bred which have foliage covered with rather long hairs which makes them relatively resistant to boll-weevil attack. Growing this variety would greatly reduce the need for pesticides, but since the long hairs clog up the harvesters, the varieties are not grown. Mechanical harvesters have been designed for monocultures; in order to mechanize, the farmer must plant crops in monocultures despite growing convictions that mixed cropping is a more "ecologically sound" practice.

5. Agricultural research is dictated by the profit motive and power mentality of food production.

Agricultural research is only indirectly related to feeding people as its orientation is directed, especially in the US, toward profit. Research is carried out by the agricultural supporting industries themselves and by the land-grant colleges whose research priorities are determined by their funding sources: private industry and a government in full support of private industry. Many more studies are done to synthesize new pesticides than to explore the benefits of biological pest control; new varieties of crops are selected for under high-fertilizer regimes while almost no work is done to explore the possibilities of soil replenishing from mixed-cropping schemes. Improving the yield or marketability of agricultural products is a well-funded focus of research while improving the nutritional quality is not. Finally, much research for agriculture in Third-World countries is done for developing exportable and profitable commodities, not for improving the staple foods of the local people.

How research is done is a function of the same ideology that defines *what* is done. Hence, complex problems are reduced to the search for profit-producing single solutions.

Conclusion

The problem of agriculture is not that there are too many people or that nature is at fault or that there is still insufficient scientific knowledge to solve world hunger: the problem is power and its use by monied interests in government and private industry to perpetuate their interests and keep the rest of us serving them.

Our program has to be to resist, thwart, and eventually smash that power.

As part of that process it is necessary to understand and expose agribusiness, the domination of the science and technology of agriculture by the chemical and farm-machine industries, and U.S. government and corporate control over land, resources, markets and prices in Latin America, Asia, and Africa.

This overview of our approach to agriculture is at the same time our agenda for studying it further. The central theme is that even where we focus on scientific and technical questions these can only be understood in the context of the political economy of food. We invite you to look into these questions further with the help of the readings listed below, and to join in our efforts to understand agriculture so as to be better able to change it.

Center for Applied Science

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The Center for Applied Science is a new group of people working together to examine the social and political basis of science and research, and to analyze and act on our understanding of the problems of agriculture, public health, and human ecology. We are trying to join with others who share our concerns. Please write to us:

The Center for Applied Science
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THE STRUCTURE OF AMERICAN HEALTH CARE

The health-care system seems so chaotic, so unplanned, so uncoordinated, that many people call it a nonsystem. To cure the health-care crisis, they conclude, we must turn it into a system. Specifically, they argue, some form of national health insurance would provide financially shaky hospitals with a stable income. Doctors should be encouraged to form group practices to increase efficiency — the equivalent of corner grocers banding together to open a supermarket. And hospitals and medical schools should be linked together into regional networks which would be able efficiently and rationally to plan for the medical needs of an entire region. More money, more planning, more coordination — that is the standard prescription for the ailing American health system.

But careful examination of the structure of health care indicates that, in fact, there *is* a health-care system; it is not totally chaotic and unplanned. It seems chaotic only from the point of view of the person seeking health care, but in fact it has become highly systematized. Years ago, the doctors did dominate and control health care; but now health care is dominated by institutions — hospitals, medical schools, research laboratories, drug companies, health-insurance companies, health-planning agencies, and many others. Many people don't even have a private doctor any more; the hospital clinic and emergency room have become their doctor. Less than 20 percent of the nation's health expenditures now go for private doctors; most of the rest goes to institutions. And, more than nine out of ten health workers these days are not doctors at

all, but workers employed by health-care institutions — nurses, dietitians, X-ray technicians, orderlies, laboratory technicians, etc. The health institutions are big and growing rapidly; as they grow they are becoming more and more interconnected to form a system.

There are three major components to the existing American health-care system: medical empires, the financing-planning complex and the health-care profiteers, especially the medical-industrial complex.

Medical Empires

Medical empires are the primary units. They are privately controlled medical complexes, usually but not always organized with a medical school at the hub. From these centers, radiating out like spokes on a wheel, are a network of affiliations to smaller private hospitals, city hospitals, state mental hospitals, neighborhood health centers and subspecialty programs such as alcoholism, rehabilitation, or prison health. To each of these affiliated programs the medical center provides professional personnel in return for health rake-offs of the affiliated programs' resources. In fact, the benefits of such arrangements are often so highly weighted in favor of the medical center that *exploitation* is the only fair description of the relationship — thus the term "empires." These networks of medical centers with their far-reaching affiliations resemble a mother country's relationship to its colonies. This resemblance has been exacerbated by the fact that many of the affiliation relationships are with hospitals, neighborhood centers and special programs in poor communities, most often populated by Blacks, Puerto Ricans, Chicanos, Asians or Appalachians.

For example, take Einstein College of Medicine (a medical school) and Montefiore Hospital and Medical Center (a close ally). Together they have come to control most of the medical resources in the Bronx, New York. Through affiliation contracts, Einstein/Montefiore monopolizes care at three out of the four city hospitals in the Bronx, the only state mental hospital in the borough, several neighborhood health centers, prison health services, several private voluntary hospitals and numerous nursing homes. Of the 6,670 beds in general-care hospitals in the Bronx, 4,500 are controlled by Einstein/Montefiore; most doctors practicing in the Bronx are affiliated with Einstein/Montefiore.

What has this arrangement meant for patients? Perhaps — and this has not been proved — the technical-scientific management of hospitalized patients has improved. But the price for this questionable improvement — questionable both in terms of money and in terms of distorted priorities — is enormous:

- In sheer dollars, the affiliation of the city hospitals to Einstein/Montefiore has increased the money coming into those hospitals by over \$37 million a year.
- In the outpatient departments of the affiliated hospitals, sub-specialty clinics have proliferated — in some cases to more than 100 in number. Patients have found their care fragmented, with no single doctor taking responsibility. On the one hand, the patient has no one to see for a common cold; on the other hand, when he or she has a more complicated illness, it takes a visit to three or four separate clinics before a diagnosis can be made, and even then a different doctor may supervise the patient's treatment each visit.

	Total Medical School Budget	Total Federal Support for Teaching & Training	Full-Time Faculty	Total Students Enrolled
56-57	160 million	11 million (6.9%)	5,000	29,000
66-67	546 million	142 million (26.0%)	17,000	34,000

The empires have their own priorities. Some of these are related to expansion and profit-making, others are related to research and teaching, and still others are concerned with control — influencing policy both locally and nationally. How much any of these priorities relate to patient care is the critical question. The answer is complicated and in many instances not yet fully understood. On balance, however, these priorities are the basis for the exploitative relationship between the medical center and its affiliates.

- In the inpatient services, (i.e., hospitalized patients), all of the hospitals were converted through affiliations into teaching institutions. Patients frequently find themselves subjected to unnecessary and occasionally dangerous procedures. Liver biopsies (removal of tissue from the liver), for example, are performed primarily to teach interns how to do the procedure; Caesarian sections and hysterectomies are performed when their medical necessity is questionable at best, so that the residents can gain more experience in performing these operations.

- In research, the affiliations have brought more academic interest to affiliated hospitals, but not necessarily more patient-oriented controls. In one such hospital, patients admitted for a routine tubal ligation (sterilization) were given medication prior to the operation and then had their ovaries biopsied to determine the effect of the medication on the ovaries. The patients were not asked for their informed consent. Moreover, it turned out that no research proposal had been submitted, as required, to the hospital's research committee.

Besides elevating the medical center's priorities with regard for patients' priorities, medical empires tend to institutionalize the unequal relationship between the mother-medical center and the colony-affiliated hospital. This is done in overt ways, with the medical center extracting natural resources from the affiliated hospital. Patients with interesting or rare diseases are taken from the affiliated hospital and brought to the medical center, while patients with mundane medical problems are "dumped" by the medical center onto its affiliates. Likewise, talented medical teachers and researchers located in the affiliated hospitals are asked to spend unpaid teaching time at the medical center. This means that their talents are utilized by the medical center while their salary continues to be paid out of the affiliated hospital's budget. When the affiliated hospital, on the other hand, wants the expertise of a researcher at the medical center, it has to pay handsomely for a lecture or consultation.

In addition to such overt discrimination, there are more subtle ways in which inequalities within a medical empire are institutionalized. Patients being referred from the affiliated hospital to the medical center for some specialized procedure, such as cardiac catheterization or cobalt therapy, may end up on waiting lists for months. The scheduling priorities are explicit: private patients come first, clinic patients from the medical center come second and the affiliated hospital's patients come third. Another example is the fact that pension programs and other fringe benefits for the professional personnel on the medical center's staff are significantly more generous than those for the affiliated hospital's staff. The list could go on and on.

Some people may minimize the importance of medical empires. "It hasn't happened here," they will say, "The county medical society is still the strongest force in town." While such an observation may be accurate in many rural and some suburban communities, the nationwide trend is very clear. In Cleveland, Case Western Reserve Medical School controls many of the medical resources. In Baltimore, it's Johns Hopkins Medical School; in Seattle, it's the University of Washington; in North Carolina, it's Duke University and the University of North Carolina. In Boston, it's divided between the Harvard Medical School, the Tufts Medical School, and the Boston University Medical School. And everywhere the results are the same: the structure of health care is organized around the institutional priorities of the

Is this case interesting enough for us?



medical center and not the health-care needs of the patient. And that disparity of priorities is most accentuated when the individual is not an affluent private patient at the medical center but a poor or uninsured ward or clinic patient at one of its affiliated institutions.

The Financing-Planning Complex

The second main part of the health-care system is the financing-planning complex. The most important part of this complex is the multibillion dollar Blue Cross operation, whose insurance plans cover 80 million people, four of every 10 Americans. Through the publicly funded Medicare and Medicaid programs, Blue Cross administers insurance benefits for an additional 32 million people. Altogether, Blue Cross disburses about half of all hospital revenues.

Because it is by far the nation's largest single health insurer, Blue Cross also plays a very important role in setting health policy: its leaders sit on governmental advisory committees, advise congressional committees, and, together with representatives of the big private hospitals, set up and run area-wide comprehensive health planning agencies.

Blue Cross is closely allied with the big hospitals. It was set up during the Depression by financially starved hospitals to provide them a guaranteed income, and it continues to be dominated by the major hospitals. Nearly half of the members of the boards of directors of local Blue Cross plans (Blue Cross operates in 74 localities) are hospital representatives. Needless to say, hospitals and health consumers often have very different interests. Consumers want high-quality, low-cost, relevant health care; hospitals, on the other hand, are often more interested in institutional expansion and the prestige gained through the acquisition of well-known researchers, fancy medical equipment and new and larger buildings. This is why the hospital-dominated Blue Cross has consistently failed to support consumer concerns such as cost and quality control.

The Health-Care Profiteers

The third part of the health system are the health-care profiteers, especially the medical-industrial complex. An alliance exists between the providers of health care (doctors, hospitals, medical schools and the like) and the companies that make money from people's sickness (drug companies, hospital supply companies, hospital construction companies, commercial insurance companies, and even companies that provide medical services for profit — profit-making proprietary hospitals, chains of nursing homes for old people, laboratories, etc.). Health care is one of the biggest businesses around, and one of the fastest-growing.

The magnitude of the medical-industrial complex is hard to believe. For example, in 1969 drug companies (Abbott, Upjohn, Merck, etc.) had after-tax profits of about \$600 million. The drug industry rated first, second, or third in profitability among all U.S. industries during the 1960's, causing *Forbes Magazine*, financial journal, to call it "one of the biggest crap games in U.S. industry."

Hospital-supply companies (Becton-Dickinson, American Hospital Supply, etc.), which sell hospitals and doctors everything from sheets and towels and bedpans to surgical instruments, X-ray machines and heart-lung machines, had after tax profits of \$400 million in 1969. Proprietary (profit-making) hospitals and nursing homes earned nearly \$200 million. (There are even nationwide chains of hospitals and nursing homes run by such businesses as Holiday Inns.)

The commercial insurance companies and the construction firms which build hospitals make additional millions, and, of course, the doctors themselves are still the highest paid people around. Even the banks are getting in on the act, with loans to hospitals both for building and for operating expenses. The patient at one of New York's prestigious hospitals, for example, finds that \$3 a day of his hospital bill doesn't go for services at all; it goes to the banks for interest payments.

The System in Health

And not only do all of these empires, insurance people, financiers, businesspeople and doctors make a lot of money from people's bad health, they do it with togetherness. Their mutual needs coincide: Prestigious medical empires require the manufacture of expensive equipment and the presence of large construction companies; and, of course, only large institutions can afford the expensive products of the medical equipment and drug manufacturers. And all of these groups require the stable, lenient financing of Blue Cross, Medicare and Medicaid and other medical insurers. Their growing interdependence is evident. Increasingly drug- and medical-equipment executives, banking and real-estate/construction-company executives sit on boards of trustees at academic medical centers. Meanwhile, hospital and medical-school professionals moonlight as consultants to drug- and hospital-supply companies and sometimes sit on their boards of trustees.

The best thing about the health business is that the profits are sure (as long as you're not a patient or taxpayer, that is). Blue Cross, Medicare and Medicaid hand the doctors and hospitals a virtual blank check. The hospital, in effect, simply tells Blue Cross how much its expenses are and Blue Cross pays the bill. In the boom years of the 1960's there was no cost control to speak of. The inflation in health-care costs that resulted has led to some belt-tightening more recently. But the accepted definition of a necessary health-care cost remains very generous.

Some costs, of course, may be necessary for better patient care. But they also may be "necessary" for the purchase of seldom-used and expensive equipment that is available in another hospital across the street; for plush offices and high salaries for doctors and hospital administrators; for expenses incurred in fighting off attempts by unions to organize hospital workers; or for hiring public-relations firms to clean up the hospital's poor image in the community. The health industry and the doctors get rich; the consumer and the taxpayer pay the bill.

Even the so-called non-profit hospitals get in on the fun. All that "nonprofit" means is that such hospitals don't have to pay out their excess income to stockholders. They also don't have to pay it back to their patients in the form of cheaper rates. Instead, they use it to grow; to buy more fancy (even if unnecessary) equipment, more plush offices, more public relations; to pay staff doctors even higher salaries; to buy up real estate, tear down poor people's housing, and build new pavilions for private patients.

There is, then, a health-care system. Its components are, in addition to the doctors, the vast network of health care resources that make up the medical empires; the financing and planning complex of agencies dominated by Blue Cross; and the medical-industrial complex. But if American health care is provided by such a big, well-organized, interconnected, business-like system, why is it so poor? The answer is that *health care is not the aim of the health-care system*. The health-care system exists to serve its own ends. The aims of big medical centers are teaching and research. The hospitals and medical schools seek to expand their real estate and financial holdings. And everyone, from hospitals and doctors to drug companies and insurance companies, wants to make profits. Health care for patients is a means to these ends, but is not the end in itself. And so the patient sees a system which is expensive, which is fragmented into dozens of specialties, which has no time to treat him in a dignified way, and which doesn't even take care of him very well.

— Adapted and updated from "Your Health Care in Crisis," a Health/PAC special report, 4th printing, November, 1972.

BIOMEDICAL RESEARCH,

POLITICS

AND HEALTH POLICY

In the thirty years from 1945 to the present, federal support for biomedical research has increased over 1000-fold to its current 1.7 billion dollar level. This increase in federal support for biomedical *research* has not been accompanied by a corresponding increase in federal support for *health care*. In fact, as shown by Stephen Strickland in "Integration of Medical Research and Health Policy"[1], the growth of the research sector was a side-effect of organized opposition by the American Medical Association to federal spending for health care. However, having expanded so rapidly, the research sector has come to play a major economic and ideological role in shaping medical training. In addition the powerful biological and genetic technologies which have been developed are generating their own social problems. Readers of this magazine are familiar with a number of these: *XYX* research (*SftP*, Sept., 1974); Genetic Engineering (this issue); misplaced priorities in cancer research (*SftP*, Sept., 1975); and exploitative human experimentation, to name a few. The origins of our present circumstances are outlined below. For an overview of the malfunctioning of the health-care system with respect to fulfilling people's health needs, see Kotelchuck's article (this issue).

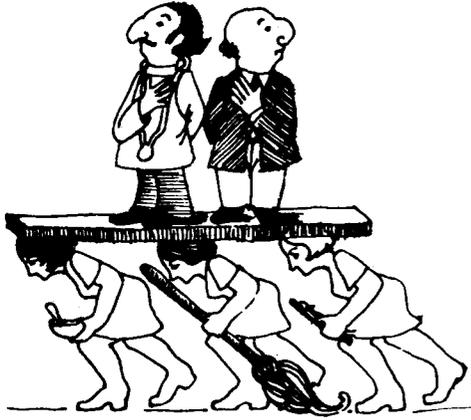
Origins of Govt. Support for Biomedical Research

Prior to World War II there was little or no federal support for biomedical research. What research support there was from the government was usually directed at aiding special agricultural interests. An early example of effective federally supported research was the discovery of the insect carrier of Texas Cattle Fever, by Theobald Smith of the Bureau of Animal Industry, in the 1880's and 1890's. State and city governments also supported some kinds of research, most notably in bacteriology and public health. This was primarily in response to the explosive epidemics that periodically created panic among all social classes and interrupted commerce. However, for the most part research was only a minor component of medicine and was supported primarily by private foundations such as the Rockefeller Foundation, with secondary support from state legislatures to their land-grant schools.

With the outbreak of World War II it was obvious that the country was not equipped to carry on a highly technical war. Thus the Office of Scientific Research and Development (OSRD) was created by Roosevelt in 1941, with Vannevar Bush at its head.[2] OSRD rapidly identified war-generated problems requiring further research and development; in the medical area these included tropical medicine (as a result of the war in the Pacific), shock and transfusion, aviation medicine, the control of wound infections, and the development of antibacterial agents. The Committee on Medical Research (CMR) of OSRD mobilized medical investigators to focus on these problems. Scientists with relevant skills were located, draft deferments were obtained, priorities were set so that scarce material was available for research, and efforts were made to ensure free and open communication among participating groups.[2] This program of coordinated, cooperative research was enormously successful, resulting in the development of sulfa drugs, gamma globulin, cortisone, and the mass production of penicillin, to name a few examples.

The CMR/OSRD efforts were a novel step in American medicine: planned, coordinated research on a large scale. At the end of the war OSRD was loathe to dissolve the research apparatus that had been developed. Vannevar Bush actively pushed for the setting up of a National Science Foundation to carry on research for national needs, for example, the Public Health Services Act of 1944, which was the precursor for our current legislation.[4] It authorized the fledgling Public Health Service to pay for research done in institutions, colleges, etc., by a system of research grants with specific authority lodged in individual investigators.[3] At the end of the war, however, enthusiasm for a national research program lessened, and CMR/OSRD was dissolved.

With the end of the rationed wartime economy of consumer scarcity came rising public demands for goods and services. One area of public pressure was increased access to health care. Hundreds of thousands of troops returned from the service, only to discover that they couldn't afford to take their kids to the doctor. In addition the standard medical examinations given to draftees had revealed that fully one-third of the draftees were unfit for service because of poor health. This was the first time the sorry state of American health had been



revealed; the AMA had previously been able to block the collecting of national health data. The selective-service statistics gave the lie to the AMA myth that all was peaches and cream, that Americans were the healthiest people in the world. Senator Claude Pepper's Subcommittee on Wartime Health and Education publicized these facts widely.[3]

Public pressure for improved health care led to congressional action — numerous bills were introduced after the war to provide national health insurance (!), federal aid to medical schools, and aid to medical students. These were fought down by a multimillion dollar public relations and political lobbying campaign mounted by the AMA, attacking “socialized medicine”.[1] Then in 1949, as a last effort, Truman introduced a comprehensive health-care bill, with a five-point program, including federal support for biomedical research. The AMA chose not to oppose the research provision. In the end, with crucial support from Senator Taft, the AMA and the southern conservative bloc was able to squash federal aid for health care and medical schools, but federal support for research was allowed to slip through.[3]

Thus began the blossoming of the American biomedical-research community. Research became the single area where a congressman could cast a vote for health. From a budget of \$52 million in 1950, the National Institutes of Health budget grew to \$430 million by 1960, to its peak in 1968 at one-billion, six-hundred-million dollars. Biomedical-research spending was pushed by a strong congressional group led by Rep. John Fogarty and Senator Lister Hill, and aided by powerful allies, notably the philanthropists Mary Lasker and Florence Mahoney. Though the money was ostensibly being spent for research, “The sophisticated congressional proponents of medical research knew that funds for medical research were building medical school budgets and increasingly supporting medical school facilities”.[3] In addition, Sputnik and the Cold War, the need to keep up with the Russians, provided additional priming for the pump of federal research support. As Strickland so clearly establishes, medical research was forced to serve as national health insurance, in the absence of the real thing.

Unfortunately little of public or congressional intention penetrated into the research community per se. In a sense this was not surprising, since it was politically necessary to pretend that research was only distantly related to national health, to avoid the stigma of “socialized medicine”. The obvious substitute was that the research was being pursued for its own sake. Though from 1950 onward almost all the biomedical Ph.D.’s in the country were fully supported by government health fellowships, there was no component of their training which reflected the public-service aspect of their training. Rather they were trained to disdain “applied” research which related directly to health, and were taught to value “pure” research, performed for its own sake. Research relating to social needs was accorded very low status. Given the fact that the research system was set up on a competitive, free-enterprise model, rather than a cooperative model, the perceived status of research areas was extremely influential. When we were in graduate school, though supported by National Institutes of Health Fellowships like our peers, we had to sign a form stipulating that our training was directed toward aiding the national health. This was widely believed to be a joke, and was a subject of abuse. That is, the socialization of scientists trained under the federal research program led to a scientific establishment uninterested in the application of research to health care. The form of the training, emphasizing intense specialization, and disregarding historical, social, and political aspects, is a component leading to a number of the current problems in health care.

The research system was of course extremely successful in generating new knowledge, and great advances were made in understanding many biological phenomena. Unfortunately very little of this knowledge has turned out to be socially useful, and the uncoupling of the generation of biological knowledge from health care needs has resulted in the knowledge accumulating in the wrong areas.

The Distortion of Medical Training by The Research Sector

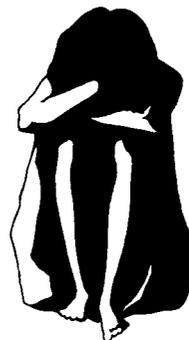
As Kotelchuck makes clear, though the U.S. has had a well organized professional medical sector for over fifty years, we have never had a health-care system. Rather we have had a medical market place, with medical care a profitable commodity whose benefits are distributed to the rich, and unavailable to the disadvantaged. This is even true at the research level, where the risks of human experimentation have been borne most heavily by those sectors of the society least likely to receive the benefits of the knowledge. Given the coupling of medical care to economic factors, it is not surprising that medical schools came to be heavily influenced by research spending.

Though private practitioners were extremely well off after the war, medical schools and hospitals, responsible for providing broader health-care services, were experi-

encing economic difficulties. The AMA block to direct or indirect federal aid to medical schools and hospitals began to be felt sharply in the 1950's. Medical Schools simply could not afford to continue operating on private income. They were rescued, as intended by Congress, by the growth of the research budget. All federal grants carried with them funds to recompense institutions for overhead costs maintenance of buildings, libraries, insurance, etc. Research grants also paid a substantial fraction of the investigators salary, and the salaries of supporting personnel. As a result all medical schools began to build research departments and research funds became a major source of operating revenues. Table 1 shows the growth of the federal component of medical-school budgets over a ten-year period. As pressure has mounted to hire researchers who bring in grant money, the traditional medical faculty has been replaced by research-oriented faculty. In fact there has been tremendous total growth of medical faculties, almost entirely due to the addition of research people. From 1951-1966 full time medical faculty increased from 3,500 to 17,000. However, as shown in Table 1, this was not accompanied by an increase in the production of M.D.'s. Research money was being effectively pumped into medical schools, but it was not moving from there to increased health-care service.

The influx of the medical researchers was one of the components that contributed to the weakening of the AMA's grip on the medical system. In a certain sense the switch was progressive, with a conservative old guard being displaced. Unfortunately their replacements, with their narrow competitive focus on "basic research" and "pure science" had very little interest or experience in the delivery of health care. Their presence in fact contributes to a new kind of distortion of the health-care system, whose control moves into the hands of a managerial elite.

By beginning a trend toward capital intensiveness in medicine (complex equipment, division of labor into specialities and subspecialities, expensive technologies, increased centralization of facilities) the balance of power moved away from the AMA — representing the solo-practitioner — and towards new forces. With its powerful guild structure the AMA had faithfully represented the historically dominant solo-practitioner, but the increasing dependence of standard medical practice on high technology and hospital facilities resulted in the subordination of the individual practitioner to the emerging elite of the doctor-managers of the large institutions, represented by the American Hospital Association. In a sense there was a kind of proletarianization of the doctor. The antagonisms of these two groups was most evident when the Nixon administration's AHA-affiliated candidate for undersecretary of HEW, John Knowles, was vigorously and successfully opposed by AMA stalwarts. But the power of the AMA has continued to ebb, leaving us now in the hands of corporate hospital managers, and an institutionalized research elite.



If a system is making its people sick should we attempt to cure the people and place them back into the system, or should we change the system?

—Ernest Mann

The Distortion of Research Priorities

The most obvious result of the uncoupling of biomedical-research goals from national health goals, is in the distortion of research priorities. Given that scientific priorities are set more or less in an ad hoc fashion by scientists, and that these scientists have been trained to believe that the research is being done for its own sake, the entire system is subject to social misuse. Thus genetic disorders, a very minor component of ill health in this country, is tremendously overemphasized due to the development of advanced genetic technologies in search of an application. On the other hand, ill health due to occupational or environmental poisoning is sorely neglected. In this case corporate influence over the decision-making apparatus at high levels holds sway, with the scientific community completely unaware of the hidden pressures (see for example reference 6).

One net result is to focus attention on defects of individuals, rather than on the state of the workplace or the general environment. Thus despite the fact that the bulk of human cancer is due to exposure to industrial carcinogens, most cancer research focuses on viruses. This creates the illusion in working people that what they have to fear is exposure to cancerous individuals, rather than poisonous workplaces. The research sector, unwilling to tackle economic and social problems, retreats to the laboratory to pursue brilliantly conceived red herrings. The precise mechanisms by which scientific priorities get distorted will be documented in a later article in this magazine. For a chilling example, read "Asbestos, Science for Sale"[6]

Jonathan King & David Ozonoff

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WOMEN IN SCIENCE

“Women D

While

From early times women have been excluded from access to any organized body of knowledge. Women in ancient Greece were educated to become housekeepers, mothers, or mistresses. In the same period Greek philosophers were trying to give answers to the fundamental questions about the nature of the universe, the meaning of life, etc., women were being praised for their ignorance and kept in women's quarters; silence was considered their best quality. The schools of learning, like Plato's Academy, were composed of a selected group of males from important families, who engaged in discussions of mathematics, astronomy, philosophy. They, of course, were convinced of the intellectual superiority of their sex; in fact, one of their beliefs was that the penalty for a man who lived badly was to be reborn as a woman in the second generation. Aristotle translated the social customs of his time into "scientific" ideas and saw women as inferior to men in all aspects; he even believed that women had fewer teeth than men and explained procreation mainly as the creative action of the male seed. The ideas of Aristotle had a great influence on latter-day biologists and scientists and to this very day his hierarchical and dualistic thinking plagues many minds.

During the Middle Ages the Church monopolized centers of learning, and science was at a low point: geometry, arithmetic, and some astronomy were all that was taught. There were women practicing medicine in the Middle Ages, mainly in Italy. A few achieved fame for their intellectual ability in convents that provided a retreat for women of the upper classes; these were practically the only places where a young woman could get some education.

During the Renaissance some universities opened their doors to women of the aristocracy, but the vast majority of women continued to live in ignorance. However, the new science that followed from the work of Copernico, Kepler and Galileo provided an alternative vision of the world and impetus to challenge the established social order. If the earth was not anymore the center of the universe, if the heavens were not immutable, if comets could appear and disappear, why should women be subject to men? Why should men be leaders and women followers? If the natural world could be different from what it was supposed to be, women did not have to accept an oppressive social order. Some women began trying to take a more active role in learning and devoted their energy to thinking about scientific matters. Women who wanted education in the sciences were the target in Moliere's play "Les Femmes Savantes": "Get rid of this fierce-looking telescope and all the rest of these gadgets . . . Stop trying to find out what's happening on the moon and mind what's going on in your own house where everything is upside down. It's not decent, and there are plenty of reasons why it isn't, for a woman to study and know so much . . . Women today want to write books and become authors. No learning is too deep for them . . . and here, in my house, they know everything except what they need to know. In my house, they know all about the moon and the pole star and about Venus,



Saturn and Mars, which are of no concern of mine and . . . nobody knows how the pot is cooking. . . .”

In the scientific environment a style and organization evolved from Bacon's ideas: Nature was to be conquered and scientists organized themselves in a quasi-military fashion to assault her. Women were excluded from the scientific societies that appeared in the seventeenth century, mainly the Royal Society and the French Royal Academy. The societies soon became conservative bodies, trying to protect narrow interests and making it hard for new ideas to gain acceptance. Membership in the societies was considered proof of scientific ability and as a result it was soon concluded that women were not able to make scientific contributions. One outstanding

SCIENCE: Women Drink Water Men Drink Wine



example was the case of Sophie Germain (1776-1831) who, well aware of the reception her work would get if attributed to a female, corresponded for three years with Gauss on mathematical topics, without letting him know that she was a woman. She signed her work "M. le Blanc". After her work on the vibrations of elastic plates won her a prize from the French Academy, she was somewhat more accepted by the mathematical circles of her time, but she never became an official member of the Academy.

Though there were many other women making important contributions at various times in different countries (see "Woman in Science" by H.J. Mozans), most of us have never heard of them; and with the exception of

Marie Curie no woman in science has been given the worldwide recognition traditionally accorded to many competent male scientists. And even Marie Curie's talent elicited mixed feelings. When she published her "Treatise on Radioactivity", Rutherford reviewed it favorably in *Nature* magazine but in a private letter to a friend he let his true feelings come out: "... Altogether I feel that the poor woman has laboured tremendously and her volumes will be very useful for a year or two to save the researcher from hunting up his own literature; a saving which I think is not altogether advantageous." Her seriousness and inability for small talk, her concentration on her work and her commitment did not gain her many friends and even at the height of her career she was not accepted as a member in the French Academy of Science. Irene Curtis, one of Marie Curie's daughters, revealed clearly some of the constraints and forces that played on her as a woman in science: "... a woman of science should renounce worldly obligations ... Family obligations are possible, on condition that they are accepted as additional burdens ... For my part I consider science to be the primordial interest of my life."

Being a member of a minority group (women in science) generates feelings of insecurity and doubts about one's own competence. In addition, a woman scientist rarely has the support of her colleagues, the trust of her department chairperson and the smooth running family life that most men scientists have. As Virginia Woolf beautifully points out in *A Room of One's Own*, women drink water while men drink wine, and if women had been left the resources for an adequate education "we could have been sitting at our ease tonight and the subject of our talk might have been archaeology, botany, anthropology, physics, the nature of the atom, mathematics, astronomy, relativity, geography ... We might have been exploring or writing; mooning about the venerable places of the earth; sitting contemplative on the steps of the Parthenon, or going at ten to an office and coming home comfortably at half-past four to write a little poetry ..."

The creativity of many of us in science is stifled in research laboratories and universities where the position of women is strangely similar to the position we have in our families. Laboratories are like households, the "head" of the laboratory is usually a male, women are found in "assistant" or "associate" positions and younger students play the role of "children". The sexual dynamics are such that few women manage to develop the skills and the self-confidence necessary to survive in an extremely competitive environment; very few are encouraged to do so. The scenario is set for the failure of the majority and the acceptance of a few "exceptions". Women are still trained to assist, not to aspire to leadership roles and to perform tasks that will allow the "big" scientist to keep his energy for higher tasks and directive functions.

Today, among 207,500 science and engineering Ph.D.'s in the US labor force, 93.4% are white and 92.1%

are male. The proportion of women becomes smaller at each higher level of degree, salary, academic position and administrative responsibility. Unemployment rates for women continue to be 2 to 4 times higher than for men with comparable education and experience. During 1973 in the biological sciences 30% of the bachelor's degrees and 21% of the doctorates were awarded to women but only 12% of the full-time biological scientists employed were women. (Data from "Professional Women and Minorities". A Manpower Data Resource Service.)

Out of the experience of support groups in the women's movement some of us have learned that conditions which enable people to work creatively and joyfully are practically nonexistent in the scientific milieu. We know now that in order to communicate clearly it is essential to feel that one is being listened to with attention and interest. Qualities that may seem to be lacking can be developed and leadership skills can be learned, if there is an interest in sharing them. However, competition for recognition and prizes does not foster good human interactions.

The image of the distracted and genial scientist, oblivious of practical details, devoting all his energy to find the solution of a problem dear to his heart is definitely a relic of the past. To work successfully in science, nowadays, is not very different from running a successful business operation. Organizational abilities, access to information, acceptance and credit from the established sources of support, these are the qualities that will determine the outcome of a scientific research endeavor. Self-confidence and being part of a network that will ensure formal and informal contacts are absolute musts. An exaggerated sense of the importance of one's own work is almost a required trait. However, when a woman in science asserts herself, she is looked upon with hostility and mistrust. A woman's work usually needs to be validated by a man's to be taken seriously. Regarding the discovery of the structure of DNA, when Rosalind Franklin's work showed that the sugar phosphate backbone of the DNA molecule was on the outside and the bases were inside the helix, she was treated scornfully until Maurice Wilkins began duplicating *her* work. Her co-workers, Wilkins, Watson and Crick received the Nobel prize in 1962 for their work and in their Nobel prize acceptance speeches her crucial contribution is barely acknowledged among a host of other citations. As a result, she is practically unknown to younger students of biology.

Until recently, a career in science had been regarded as very desirable. Scientists have, for a long time, maintained a sort of careful distance from the general affairs of the community and acted as "experts" when consulted about matters that related to their work. The belief in "professionalism" has protected the scientific community from serious self-examination and criticism. Scientists evaluate each other — there is not outside opinion on scientific issues that they will listen to. At the same time, since science is a social activity, and is usually funded by governments or powerful private institutions,

many scientists find themselves reluctant to speak out against policies that are being developed by their funding agencies. Scrupulous honesty in laboratory matters is not necessarily matched with a courageous and strong commitment to the good of the society-at-large. An obvious example of this is the role that American science has played in the destruction of VietNam. It has become clear that scientific enquiry that divests itself of social responsibility will not contribute to solving the problems around us; on the contrary, it will create new ones. The connections between the scientific and the military establishments, the hydrogen bomb, nuclear testing and recent developments in the life sciences have begun to change the realities of science. It does not seem as desirable anymore to try to incorporate women into the mainstream of American science. It would be a tragic mistake for women to become scientists and not to advocate a humanistic or committed science. We have to question the process by which scientific work is accomplished and its product. We are taught to approach problems with a purely cerebral attitude and *not* to bother with the consequences or ramifications of our work. The pressure is "to keep things separate": scientific inquiry on one hand and human concerns on the other. This way of working leaves little room for our development as human beings and opens the door to the creation of exploitative technologies. We stand powerless, producing knowledge that can be used against people in a variety of ways. The myth of value-free science is being replaced by an awareness that science perpetuates and generates values.

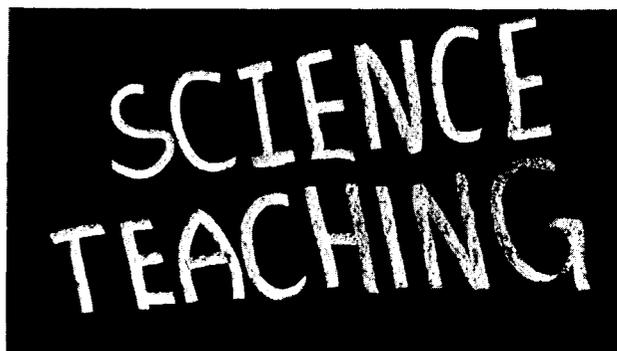
As women, we know from first hand experience that a purely mechanistic approach can add very little to knowledge. Living in a patriarchal culture, scientists have usually studied females as the reproductive systems of the species and have reduced us to our reproductive organs, our secondary sexual characteristics and/or our sexual behavior.* "Scientific" rationalizations have been offered for the secondary status of women, blacks and poor people. Nonscientists have been consistently discouraged to participate in science policies and their opinions have been considered irrelevant or plainly disregarded.

The task that seems of primary importance, for both women and men, is to convert science from what it is today, a social institution with a conservative function and defensive stand, into a liberating and healthy activity: science with a soul which would respect and love its objects of study and stress harmony and communication with the rest of the universe. When science fulfills its potential and becomes a tool for human liberation we will not have to worry about women "fitting in", because we will probably be at the forefront of that "new" science.

Rita Arditti

*"Women as Objects. Science and Sexual Politics." Rita Arditti. *Science for the People*. September 1974.

The Boston Science Teaching Group



Getting together with a group of people who do the same type of work as you do and discussing the pros and cons of that work can be quite valuable. Doing just that has been one of the functions of the Boston Science Teaching Group of Science for the People. For the past five years a group of high school and college science teachers, students, and other interested people have met once every two weeks to share their thoughts and ideas and to plan activities aimed at mitigating some of the frustrations of teaching science in this society.

We have benefitted greatly and learned much from these discussions. One of the important things we have learned is that each of us is not alone in our frustrations and alienation. Indeed, we share common problems. For example, many of us are alienated in our work because of excessive course loads and school or curricula restrictions. We have learned that schools in general are alienating for both students and teachers and that science is almost always considered a real 'turn-off'. We found that science is viewed as another of those subjects for which there is always a 'right answer' and that students after many years of exposure to this no longer have the confidence to come up with their own ideas and answers. These problems, coupled with curricula that foster non-critical thinking, make teaching in general and teaching science in particular a formidable task.

As teachers we have found ourselves in a double bind or contradiction in that we are not only a part of the educational system that functions to socialize people into this society, but we are also part of a group which wants to change both the socialization and the society. The enormity of the task is horrendous since the educational system is but a small part of the larger society, and merely reflects the larger society which it serves. The United States is a highly competitive society built around certain myths of freedom, choice, democracy and justice. The schools maintain these myths despite the fact that most people have few options and live in a state of financial insecurity and political impotence. Schools, both by their structures and curricula, reinforce the idea that most people's poverty and alienation are the result only of their own stupidity and personal failure to achieve and not at all connected to the political or economic structure of society.

What ways have we as science teachers found to cope with these contradictions in our jobs? Besides discussion, one of the inroads we have attempted in our teaching is

to bring out and make obvious to students the so-called 'hidden curriculum' in the materials we are studying. By the 'hidden curriculum' we mean the types of values or beliefs that are inherently in any curriculum material we utilize, i.e. the unspoken or sometimes omitted messages that accompany all those supposedly value-free scientific facts and concepts.

One of these values is the myth of apolitical, benevolent and all-knowing science. This myth includes the idea that the answer for all social ills would be found through scientific research, if only there was more or better funding. Problems as diverse as headache, indigestion, poor working conditions, hunger, inadequate energy supply etc. supposedly can be solved via more and better scientific research. A restructuring of society is never suggested or implied. The myth is reinforced by curriculum materials which involve only the technical aspects of a particular science and never the social, economic, political or ethical aspects of the subject. The science presented by most curricula is of the 'pure' or theoretical variety which relates little to the practical needs of everyday life. This tendency to dwell on the theoretical aspects of science is also used as a means of tracking students, separating them into the more elite group (those who may go on to become scientists) and the lower-echelon group who are considered unable to comprehend the complexities of such esoteric subject matter. The elite or "academic" students might never for example learn how to repair basic electrical appliances but they would become experts on electrical theory, while the non academic or slow groups never learn the theoretical basis for the operation of mechanisms they learn to repair. Often both teachers and students develop condescending and patronizing attitudes toward those who do not study theory. This is another way in which curricula and schools reinforce the social divisions and class structures that exist in our society.

Another value which permeates science curricula is the image of the scientist. In most curricula a scientist is portrayed as a very special person of prestige, status, importance, strength, honesty and brilliance. He (never she) is a person who does work that ordinary people like ourselves could never even aspire to, let alone do. Quite importantly, the scientist portrayed is almost always a white male who is often dressed in a white lab coat and wearing glasses. Given such an image, it's not surprising that science is a turn-off for most kids.

In addition to exposing the 'hidden curricula' in our classrooms, we continually attempt to raise questions about the social aspects of the scientific areas we might be studying. For example, when discussing ecology, we also discuss the politics and economics of overconsumption and waste; when we study genetics we also examine the social and ethical aspects of genetic engineering and when we study nuclear power or common diseases, we examine the politics of energy and the functioning of the health-care-delivery system in the U.S. and China. An outgrowth of the need to examine the social impact of science has been the writing by the Science Teaching Group of a series of alternative curriculum materials to be used as supplements to the standard science curricula in high schools and colleges. Known as the 'Science and Society Series,' it consists of pamphlets on areas such as Energy, Women and Health Care, Genetic Engineering and nutrition. Most of us use these materials in our own classrooms.

Although we realize that examination of the 'hidden

curriculum' and/or bringing to the classroom an awareness of the political and social aspects of science will not bring about the kind of fundamental changes that are needed in this society, we do see our work as a part of a larger struggle. Clearly greater changes are needed to change the way science is taught in our schools and how it is used in this society.

Being a part of a group of persons who are struggling in similar ways provides support and incentives. By working together in supportive ways during the past few years, members of the science teaching group have developed important skills and have been empowered to continue our struggles. We have also learned to work as a collective; to share responsibility for getting things done and to engage in constructive and supportive criticism within the group. We have also learned to tolerate differences and contradictions and thus continue to see ourselves as a part of a greater movement towards social change.

Pat Brennan

Ten forty-three,
In exactly TWO MINUTES
I'll ring the
FIRST BELL and
they'll all
stand still!



All, that is, except
your potential DEVIATE!
Your fledgling REBEL!
Your incipient BOAT-ROCKER!
They'll try to move all right!
THEY'LL have to
learn the HARD
way not to move!



So I'll SCREAM at 'em
and take their NAMES
and give them FIVE
DETENSIONS and EXTRA
HOMEWORK! Next time
they won't move
after the first
bell!



Because when they've
learned not to question
the FIRST BELL, they'll
learn not to question
their TEXTS! Their
TEACHERS! Their
COURSES!
EXAMINATIONS!



They'll grow up to accept
TAXES! URBAN
REDEVELOPMENT! POL-
LUTION! INFLATION!
NATIONAL DATA BANKS!
CORRUPTION! RACIAL
DISCRIMINATION! UNEM-
PLOYMENT! EMPLOYMENT!
SLAVERY! GENOCIDE!



Non-movement
after
the first
bell is
the
backbone
of Western
Civilization!



-Something Else-

SCIENCE AND TECHNOLOGY

IN THE THIRD WORLD

The Third World is that part of the world which has been ravaged by colonial exploitation and in which as a result there is now hunger, poor health and illiteracy among the masses of the people. Almost all of Latin America and Africa fall into this category as do large parts of Asia and the Middle East.

A central problem of Third World peoples is the development of their productive capacity to meet their basic material and social needs. Of course science and technology are essential instruments for achieving this development, as has been shown by the People's Republic of China (see *China: Science Walks on Two Legs*). However, while science and technology seem to be necessary conditions for development, they are not sufficient. We cannot talk meaningfully about science and technology alone, in isolation, but only within the framework of their social, economic, and political impact. What kind of development will science and technology be used to achieve in the Third World?

To date, the introduction of science and technology in the Third World has been part of the more general involvement of western industrialized nations in the Third World. Although the technologies of mineral extraction, industrialization, intensive agriculture, counterinsurgency, and population control, among others, have been used to further economic development in ways judged beneficial by multinational corporations and western industrialists, this has been done only at a great cost to the vast majority of Third World peoples. The function of science and technology has been to aid in the misdevelopment of Third World economies. With the introduction of each new technological artifact bearing the imprint of the United States, social strife and oppression mount in the Third World.

Let's see why this is by looking at the main ways in which science and technology are introduced into the Third World:

***The Green Revolution** — This is the name that has been given to the recently developed technologically intensive form of agriculture based on new high-yield varieties of wheat and rice. High yield, that is, when planted in conjunction with optimum levels of irrigation, chemical fertilizers, herbicides, and pesticides.

Was the Green Revolution invented by the Rockefellers and developed by the U.S. Agency for International Development (AID) in order to feed the peoples

of the Third World? No. By creating a dependency on the manufactured inputs like fertilizers and pesticides necessary for this form of agriculture, the Green Revolution brings once-isolated farmers into the capitalist market system. The growers who use the new seed must sell part of their crops for cash in order to purchase such inputs — and these market relations function as a form of control. For international agribusiness, with AID-, U.N.-, and World Bank-financing of irrigation systems, fertilizers, and tractors, resulting in huge profits, the Green Revolution promises yet more demands for their equipment and products.

What has been the impact of the Green Revolution on the Third World? (1) It has increased the inequities between various regions of a country — those regions with an abundance of fertile, irrigated land have benefited greatly while the poorer regions have remained poor. (2) Since it has been the larger, wealthier, commercial farmers who have had the resources to implement this form of agriculture, they have benefited disproportionately. Tenants have been driven off the land, marginal farmers have been wiped out, and rural, landless laborers have been left unemployed. In other words, the social class divisions have been aggravated as agriculture becomes industrialized and mechanized. (3) The growth of unemployment in the countryside has resulted in a migration to the cities, thus swelling the urban population. (4) Since crop-price supports are normally guaranteed to help pay the increased cost of the Green Revolution technology, the price of foods has increased, hurting the poor who already have trouble paying. (5) Lands previously used to grow food, have been converted into large plantations for growing cash crops for export, thus lowering a Third World country's ability to feed its own people. (6) The ecological instability of Green Revolution agricultural systems leaves them vulnerable to adverse weather conditions and pesticide infestations as has been demonstrated in the last couple of years.

To summarize these effects, we may say that the Green Revolution simply reinforces the adverse social conditions which already exist in the Third World. It worsens the distribution of wealth geographically and by social class, causes disintegration of village life and the growth of urban squalor, while at the same time it increases the wealth and power of the ruling classes. The Green Revolution epitomizes misdevelopment, and has been a disastrous failure for Third World peoples.

***Industrial Misdevelopment** — What has been true of Green Revolution technology is also true of technology for industrial production. The purpose of this technology is to aid in the extraction of vital natural resources from the Third World and to aid in foreign exploitation of the human labor found there.

What has been the impact of this technology? First, because of its concentration in areas of production which serve the needs of capital, it reinforces the inequities which themselves are the product of a history of capitalist development. Tremendous investments have been poured into the primary extraction industries, not because the Third World now needs an especially large amount of oil or copper, but because huge markets are available abroad and labor is cheap in the Third World. So too, in the manufacturing industries, where the goods which produced depend upon what is generally marketable in moneyed sectors. Thus the pattern of the outflow of resources, first from the countryside to the urban areas and second from the Third World to the overdeveloped world, is one which increases the maldistribution of material resources; the U.S.'s 6% of the world's population has come to consume 50-60% of the world's resources.

Second, because of the highly advanced form of technology, the imported manufacturing processes, agricultural processes, mineral extraction processes are capital intensive, not labor intensive. Hence, in spite of high levels of production, the number of people employed is very low. This situation results in growing unemployment, poverty, and urban squalor. It keeps wages low, consumption low, and standards of health and nutrition low.*

Third, with all the highly sophisticated forms of technology, the most basic needs of the people still do not get met. Televisions abound but hospitals are rare. One aspect of the problem is that technical expertise is predominantly in areas of interest to foreign capital, for example in petrochemical technology, but areas like health care are virtually ignored. This situation is largely the result of U.S. training programs which have been established to supply the technostructure for foreign investment.

In summary, U.S. investment and the technology that accompany it make the road to rational economic development a very difficult one for the Third World to travel. That's why it is in revolt, seeking independence from foreign economic and political control.

***Population Control** — Faced with what is now regarded as the dismal failure of capitalist economic development to meet the material needs of the masses of Third World people — which of course it was never meant to do —

*In Puerto Rico investors obtain a 28% return of invested capital (twice as high as in the U.S.) while the average wage of a Puerto Rican industrial worker is 1/2 to 1/3 lower than the North American level. At the same time the cost of living in Puerto Rico is 25% higher, and the official level of unemployment in May, 1975, was 22% (30% unofficial.)

U.S. investors have put the blame on the Third World peoples themselves. There's too many of them. They make too many demands on the resources, natural and human, which are being depleted by foreign investors.

Birth-control technology is not seen by the Rockefellers, who have pushed birth control programs from the start, as a tool for giving Third-World women more control over their lives. It is seen rather as a tool for controlling population. U.S. investors want just the number of poor or unemployed people needed for high profits, but not so many as to jeopardize social and political stability.**

U.S. AID funding of population-control programs rose from less than \$4 million in 1965 to nearly \$100 million in 1971, while at the same time funding of health and educational programs decreased. U.S. multinational corporations are not trying to end malnutrition, hunger, illiteracy, and poverty in the Third World. They are trying to stave off revolution. Population control is to control people.

***Counterinsurgency** — While population control programs have been pushed by Rockefeller, Ford, and AID, as a way of disguising the real problems which exist in the Third World — the problems of foreign domination and exploitation, maldistribution of wealth, of economic social, and political misdevelopment — they have been no less vigilant in protecting their interests by more direct means. The Indochina War, the CIA coup in Chile, the billions of dollars of military aid to Israel, and the recent intervention in Angola are but the most obvious examples. From the automated-air-war technology developed for use in Indochina to the most sophisticated counterintelligence apparatus for covert police operations in the Third World, the full resources of U.S. technical expertise have been put to work to subvert the popular aspirations of Third World peoples.

The latest police and military technology, however sophisticated and feared by the people, is not in itself adequate to maintain political stability. A successful counterinsurgency strategy, as a National Academy of Science panel reported in 1967, requires knowledge in intimate detail of a society's culture, history, and social infrastructure.*** This is where Third-World-studies programs and social-science research enter the picture. Innocent as foreign social-science-research programs might appear, they are supported by over 25 government agencies as well as the Ford and Rockefeller Foundations, through military think-tanks, nonprofit research

**35.3% of Puerto Rican women of childbearing age have been sterilized according to a study done by Puerto Rican demographer Dr. Jose Vasques Calzada in 1968. Almost two-thirds of the women are between the age of 20-49 years, with 92% under 35.

***This study is printed in Hearings of Senate Foreign Relations Committee on D.O.D. Sponsored Foreign Affairs Research, May 9, 1968, pg. 66.

centers, and university programs, all as part of a program to provide the intellectual resources and information infrastructure needed for the penetration and expansion of U.S. capital in the Third World.

* *Science as Cultural Imperialism* – The exploitation of the Third World, its natural resources and the labor of its people, to the tune of a multibillion-dollar investment backed up by billion-dollar expenditures in counterinsurgency and population-control technology is part and parcel of what is called the imperialist system. The particular form it takes in most of the Third World is neocolonialism — control not through direct military rule, but through a local regime totally dominated by the weight of U.S. economic, military, and technological power. In addition to the many activities which are directly related to U.S. economic gains, there is a vast network of supporting activities which limit the options of Third World peoples for alternatives to foreign domination. These affect education, mass media, organized labor, community relations, etc. Though more subtle, they still constitute imperialism — cultural imperialism, the denial of a people's culture and history.

There are two aspects of cultural imperialism: one is the emulation of foreign cultural forms and their substitution for the native culture, and the other is the spread of neocolonial ideology. Science plays an important role in both aspects: First in the transfer of science to the Third World in a form which directly replicates U.S. science, a form which is totally inappropriate to the problems and conditions of Third World peoples. Second, in the perpetuation of an ideology which defines scientific and technological growth as progress, and the ultimate solution to the problems of social and political oppression. Closely related is the myth of the political neutrality of science and the conception of science as the domain of a certain elite.

Science becomes an agent of cultural imperialism through the many scientific and educational aid programs which export U.S. science textbooks, curricula, apparatus, research establishments, and educational programs to Third World countries. These are enhanced through international conferences such as the June 1973 Mexico meeting of the American Association for the Advancement of Science (AAAS). The result of this scientific/educational penetration is the production of thousands of engineers and scientists totally unable because of their training to solve local technical problems or who think doing so is beneath them, or who for these and other reasons go down the brain drain to the U.S.

When we view science and technology within the context of the relations between the rich, advanced technological countries and the poor peoples of the Third World, we see that the multiplicity of technological aid programs for the Third World are not in the slightest way charity. Rather they are designed to serve the large corporations whose interests lie in the promotion of economic growth within the capitalist system of private investment. The conflict between capitalist forms of

economic development and the needs of the vast majority of the people of the Third World has been the basis for the class struggles which have erupted throughout the Third World in recent years. If anything, these contradictions are worsening and the struggle of the people against oppression will escalate. In the light of these political struggles science and technology can have no neutrality.

This fact is understood in the Third World. Its best expression appeared in a document prepared by a host of Mexican scientific and technical groups and Science for the People in June 1973 in opposition to the AAAS Mexico City meeting:

If we do know that there exists a science which is imperialist in its uses, its organization, its method, and its ideology, there must exist, and in fact there does exist, an anti-imperialist science. It is still in its infancy, and it takes different forms, according to the conditions it is found in. In colonial countries, dependent countries, or imperialist countries, it begins by exposing and denouncing: we denounce the use of science in the service of domination and exploitation; we denounce the use of science's name in the new pseudo-scientific racism; we denounce the conversion of science into a commodity and of our universities into corporate offices. From denunciation we move to active criticism; we look for means to put our scientific knowledge at the service of the people, and therefore as an instrument of revolutionary national liberation movements.

We challenge the system of training which tries to continue producing obedient experts. We are beginning to develop a new science on behalf of the whole of technology and society — an integrated science which refuses narrow specialization and idiot realism. We repudiate hierarchical-classist structures in order to search for forms of collective work and more democratic forms in research as well as in training. We repudiate the mystification of a science reinforced by a specialized vocabulary and we will launch a campaign to popularize science. As scientists and revolutionaries we unite with anti-imperialist scientists of the world and with popular movements of our countries.

The focus of world science has to change, as it has changed in the past. But the new science which will be developed in the Third World cannot and must not copy the bourgeois science which it displaces. We will make a new science whose form and content form an integrated part of the struggle for human liberation.

Al Weinrub

FURTHER READINGS

For documentation of the arguments made briefly in this article, see "Science and Technology in Latin America," *SftP*, December, 1972 and a host of articles in past issues of *SftP* (write *SftP*, 16 Union Sq. Somerville Mass. 02143 for an index).

Book Review

Research and Revolution, Science Policy and Societal Change in China: Richard P. Suttmeier, D.C. Heath and Co.

During the last four years several hundred scientists and technologists from the United States have visited the People's Republic of China (PRC). The duration of stay of recent visitors in the PRC has usually been from 2 to 4 weeks. In spite of the brevity of their visits, American scientists have returned with fascinating reports of work in their specialties including agriculture, archaeology, biophysical research, high-energy physics, earthquake research, computer technology, medicine, health care and many others. These eyewitness accounts, admittedly incomplete and superficial in many respects, cover the period from 1971 to the present, a period in which the results and effects of policies and directions implemented and initiated during the Cultural Revolution (1966-1969) have just begun to emerge. This is exactly where the book, *Research and Revolution*, ends its description.

Research and Revolution, by Richard P. Suttmeier, written in 1971 before the rapprochement between the U.S. and China, is concerned with science and technology policies and programs and their consequences on the development of Chinese society since the founding of the PRC. The book is of sociological genre and intended mainly for China specialists, although the author states that the book might be of value for those who are troubled by the problems of science and society seeking an alternative approach. For presentation and analysis, Suttmeier identifies four periods: 1949-1957 (organization building), 1957-1961 (Great Leap Forward), 1961-1966 (Consolidation and rationalization), and 1966-1971 (Radical destruction and reconstruction).

According to this study, during the periods covered, the Chinese pursued mainly two approaches in science policies: (1) the so-called bureaucratic-professional model and (2) the so-called mobilization model. In the bureaucratic-professional model, as practiced by developed countries including the Soviet Union, the responsibility of scientists and technologists are limited to



teaching, research, development, as well as some administration. The aim and purpose of the bureaucratic-professional system in developed countries, as now perceived by many, is to serve the needs of a highly centralized industrial sector for the profits of private enterprise and the military-industrial complex.

Except during the period of the Great Leap Forward, the bureaucratic-professional model was followed until the eve of the Cultural Revolution (1966). This approach, which was severely criticized and subsequently discarded during the Cultural Revolution, tended to become highly routinized, urban-based and elitist. During my 2½ month visit in China in 1973, I was told that scientists in such a hierarchical system became autocratic and frequently pursued either personal research interests or duplicated the findings of others with little originality. They did "research for research's sake" ignoring the needs and most pressing problems of the country. In other words, "bourgeois" intellectuals still operated in the old way: regarding knowledge as private property; theoretical work as the only work worth pursuing; seeking peer recognition, international fame, and material reward; or doing things with comprador mentality.

The second approach described in *Research and Revolution* is the mobilization model which was initially adopted during the Great Leap Forward (1958) and had its origin in Yen-an in Shensi Province during the period from the 1930's to 1940's, which is now known as the Spirit of Yen-an. In the Chinese description, it is called "Walking on Two Legs". (See *China: Science Walks on Two Legs*, Avon Books, New York, N.Y. 1974. 316 pp.) The essential features of the Yen-an Spirit are emphasis on close contact between the leader and the masses, decentralized organization, and a socialist ideology. The overall policy of "Walking on Two Legs" stresses relying on one's own efforts in undertakings such as the simultaneous development of agriculture and industry at both national and local levels, large and small enterprises using all available methods both modern and traditional. In science and technology, "Walking on Two Legs" means training and raising the standard of scientific and technical personnel on the one hand, and encouraging scientific experiments by the masses on the other hand. More succinctly, scientific workers should, according to Mao Tse-tung, "make the past serve the present and foreign things serve China". In actual practice, we see the so-called "three-in-one" participation in research institutes, universities, factories and rural communes. For example, once an item for scientific research or technological development is determined, a "three-in-one" team consisting of responsible cadres, scientific and technical staff and workers or peasants is set up to see that the project is properly carried out. Although the mobilization model, as pointed out by Suttmeier, tends to downplay the role of professional and academic science, my impression is that the Chinese consider theoretical development as an essential component of overall scientific endeavour. At the present, applied science, especially in areas directly related to the welfare of people, is given top priority.

Viewed against the above background one would like to ask "How successful have the Chinese efforts to develop an indigenous scientific and technological capability been? To appreciate Chinese efforts, one must keep in mind the very low level, in many areas the nonexistence, of scientific and technological activities prior to 1949. In less than twenty-five years, the training of an estimated 2 million scientists and technologists and the establishment of hundreds of research and development institutions across the country are most remarkable accomplishments. China has essentially solved its food problem and is self-sufficient in petroleum with all indications that it will soon become an oil-exporting nation. Pursuing the policy of "Walking on Two Legs", China in recent years has achieved successes on many fronts such as in synthetic organic chemistry (insulin), nuclear technology (atomic and hydrogen explosions), computer science (integrated circuits), and satellite launching. The most spectacular achievement, in my view, has been in medical science and health care. The training of more than 1 million "barefoot" doctors has dramatically improved the health of people and sanitation standards.

As already mentioned, Suttmeier's book was completed before the reestablishment of direct contacts between the U.S. and China. As a result, *Research and Revolution* is more like a history of science than a survey of current science policies. As a non-historian, I find the most readable portion of the book is the last chapter. "Conclusion: On the Idea of a Chinese Model" summarizes in a clear and concise manner the problems and difficulties encountered by the Chinese in their attempt to integrate science with society and social change. In *Research and Revolution*, Suttmeier tends to view the development of science and technology policies as an isolated phenomenon, whereas in fact the impressive achievements in science and technology are contingent on the most profound political changes in the course of Chinese history. The aim of *Research* is not publications in scholarly journals nor is the aim of technology the manufacturing of devices, but the question the Chinese have been grappling with is how to use science and technology for the welfare of the majority of people. The long-range aims for the *Revolution*, according to Mao Tse-tung as quoted by Suttmeier (Chapter 2, p. 29) are class struggle, the struggle for production, and the struggle for scientific experiment. Clearly, science is not an isolated aspect of China's developmental policies but it is an integrated part of the plan for building a true socialist society with a new kind of individual who will be more concerned for the welfare of others and the world at large than for oneself. Hence, the way China uses science and technology for social purposes cannot be appraised apart from the economic, cultural, and political settings. Towards the end of *Research and Revolution*, Suttmeier asks "Is the Chinese model exportable or replicable?" for developing as well as developed countries. Such a complex question is not answered in the book. But the Chinese experiment, affecting a quarter of humankind and without precedent in history, is in progress. It is hoped that Suttmeier will write a sequel to his unfinished *Research and Revolution* with abundant data now available.

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SOCIAL SCIENCE RESEARCH: A TOOL OF COUNTERINSURGENCY

Today, there would be little research in U.S. universities without federal support.[1] But this was not always so. It started small, in the last decades of the last century, when the process of adapting a social-control strategy from the United States' then-imperial rival, Germany, was begun here.

Bismarck's 19th century Germany boiled with class struggle: rapid industrialization, with repeated recessions, led to the organizing of working people's associations which were often avowedly socialist. Guns and soldiers suppressed the uprisings of working people, and a national program of state-directed reforms was initiated to make life more bearable for them so that rebellions would not re-emerge once existing organizations were smashed. The reform program was called *Sozialpolitik* (social policy), and was developed in its modern form by a group of German social scientists[2] as a nonsocialist answer to the popular demands for social justice advanced in theoretical form by Marx and Engels.

It was Prussian tradition for prestigious professors to work in the government, using their academic skills to help solve the practical problems of administering society. Many of their students were young intellectuals of the American bourgeoisie who recognized that the organization of the Bismarckian welfare state was a reasonable model for the United States, where industrial conditions were substantially similar to those of Germany. The U.S. Civil War had cleared away various political impediments to an industrialized economy dominated by Northern capital, and the political ideology of *laissez faire* individualism suited the rapid accumulation of capital into more and more centralized holdings. But as the control of entire sectors of the U.S. economy by a relative handful of corporations became greater, the ideology and practice of *laissez faire* became less useful. It made the natives too unruly; the higher, more monopolistic, stage of development of industry created the need for a more orderly integration of the country's population into a system dominated by the largest busi-

ness interests. It was bad for industry that there should be such labor struggles as had been raging for decades; it was downright inefficient. Just as bad or maybe even worse, an influential part of the ideology of that struggle challenged the overall power relations in capitalist society: socialism as a possible solution to the human strains that capitalism created had significant organized support among American working people in the late 19th and early 20th centuries, just as it did in the European countries from which they had emigrated.

The historical problem on both continents was due to the capitalist system of organizing human work: it separates control of the social wealth from those who produce that wealth. Since privately controlled distribution of the socially produced wealth is inequitable, social struggle is inevitable. The bourgeoisie's principal response to this social struggle has historically always been to try mightily to exterminate it by whatever means necessary. *Sozialpolitik* and the *corporate liberalism* [3] which was its North American counterpart were clearly preferable to violent repression, though of course these "enlightened strategies" did not rule out more brutal tactics, as is clear from the study of American history.

The American students in Germany[4] imported this strategy when they returned home, and in 1885 they founded the American Economics Association, where Adam Smith's *laissez faire* theory, which barred the government from interfering with the economy, was supplanted by the German school built around the principles of economic and social-policy planning on a national level. The new way to handle social struggle was prevention, accomplished through the application of scientific analysis to the administration of capitalism's institutions. It was the Progressive Era in the United States, complete with the Pragmatic Faith[5], the orientation to social control which posited that the intellectual labors of science and technology could uncover the pertinent facts, which an efficient government could then use to make policy which would solve the social ills of

capitalism. It was the dawning of the corporate liberalism of the early 20th century — the vision of a reformable capitalism within the domination of the even-then giant corporations. Labor was to be brought into partnership with capital and the spectre of socialism laid to rest.

The problem was framed in terms of attempting to eliminate social injustice through raising labor's productivity, thereby raising the amount in labor's slice without having to change its proportional size. But the size of the whole pie could only be increased with the cooperation of the labor force. And co-operation on such a scale meant among other things social engineering of a sort — the conscious use of scientific techniques to formulate social policy.

It was within this configuration of practice and theory that responsibility for organizing academic social science began to be assigned to government. The task of applying scholarship to the problems of administering 20th-century corporate capitalism was formally institutionalized in the United States with the creation of the first policy-research organizations: the Institute for Government Research (which later became the Brookings Institute), the National Industrial Conference Board, the National Bureau of Economic Research, and the Twentieth Century Fund. All were organized in the five-year period surrounding World War I. These liberal policy-research organizations were to supply the facts of the workings of the country's political economy; they would be doing "social science that would admit of conclusions not influenced by the social ends of classes."^[6] It was to be the ultimate answer to the socialist rabble-rousers; it was science, therefore it was fair. And it would make capitalism good for humans.

The first proof of the pudding arrived as World War I materialized amidst the pollyanna visions of partnership between labor and capital. Again, a piece of Germany's social-management strategy was imported and laid onto the foundation of collaboration between business, academia and government which had hardly set. This was the practice of centralized organization of science work.

In the U.S., the National Academy of Sciences (NAS) had been chartered by Congress during the Civil War to advise the Northern government on science matters. It was the first use in this country of orderly access to scientific work as a military weapon, but productive forces had not yet developed to the stage where a separate administrative apparatus was necessary to integrate intellectual work and production. By 1916 that stage had arrived, because a shooting war with Germany meant the abrupt cut-off of the German piece of the international capitalist economy. German science and technology, on which a certain amount of the U.S. economy depended, became unavailable. At the same time, the threat of an impending trade war with Germany necessitated the rapid development of the United States' own technical capacity.^[7] It was perhaps *a bit* like the situation in China in 1960 when the Soviet Union recalled its technical experts; it became immediately necessary to organize the intellectual work capabilities of one's own population.

It was at this time that the National Academy of Sciences was called upon by Wilson to expand into directly organizing the scientific resources of the U.S. In his executive order, Wilson stated that "true preparedness" would result from the application of science not to military problems only, but to all areas of industry as well as to the advancement of knowledge without immediate practical significance.^[8] Out of this grew the National Research Council (NRC), a federation of research laboratories^[9] supported by the Carnegie Corporation, the Rockefeller Foundation, the Engineering Foundation, the U.S. War Department and the Council of National Defense.^[10] Its financial support came from the accounting ledgers of the class which owned the means of production in the United States; such members of that class as George Eastman, E.H. Gary, A.W. Mellon, Pierre S. DuPont, and Ambrose Swasey (Engineering Foundation) personally participated in its operations through a system of advisory committees to the Council's thirteen divisions.^[11]

The divisions of the NRC were "constituted of the representatives of the leading national societies in . . . [various scientific] subjects"^[12] plus representatives from universities, research foundations and industrial laboratories. Representatives of the government were appointed by the President and included "heads of the scientific and technical bureaus of the Army and Navy and the civil departments . . ."^[13]

During the war, the NRC set up research committees in most of the country's universities "to concentrate the research capacity of these institutions upon scientific problems of war work".^[14] Those committees were not dismantled, however, with the end of the war. The organizational net we move about in nowadays whenever we do physical or social science research is descended from the early NRC and takes from it its basic form. Unlike the honorific NAS, the NRC existed to organize the research work which had just achieved full recognition as the substrate of the technological base of U.S. power. With the end of the war the NRC was made a permanent institution by executive order of President Wilson, and was assigned the overall responsibility of determining the extent of research capability in the U.S. and Europe and then figuring out which fields could be developed through organized effort.^[15]

Erily, it was the Army and the Navy Intelligence Services which did the surveying of research in various parts of the world and the disseminating of the information collected to all appropriate government and scientific agencies.^[16] It is, after all, the military arm of the government which has to secure the territory exploited by business corporations; the military's technological needs are deep, and its access to the intellectual workforce must be direct. The military also has a desirable management characteristic: a far-flung network under centralized control. It is a consistent fact of U.S. history that war has been the energy of organization in science — as the reader will presently see in the case of social science. It therefore follows that the military should itself see to

the generation of that science work deemed necessary for its mission.

During the inter-World War period, the use of academic work in governing came to be accepted as indispensable.[17] For example, a series of social science studies commissioned by President Herbert Hoover and carried out during the 1920s and 1930s both by the existing policy-research organizations and by special government advisory committees was, according to a government report, supposed to give

a complete, impartial examination of the facts . . . to help all of us to see where social stresses are occurring and where major efforts should be undertaken to deal with them constructively. . . . The means of social control is social discovery and the wider adoption of new knowledge.[18]

Social control through social discovery meant the “organization of social intelligence”[19] to manage society-wide problems. This necessitated a conscious strategy for organizing intellectual workers; since the main body of the intellectual workforce is in academia, that required the systematic organizing of academic workers to do whatever work was at any given time deemed necessary.

Accordingly, a government study entitled *Research — A National Resource* [20] noted that organizing strategy since World War I had proceeded through “decentralization of research activities by governmental agencies and centralization of research workers through the organization of national councils,”[21] and recommended the expansion of the contracting-out system as the line of development most likely to yield the desired results. The national councils referred to were the National Academy of Sciences, the National Research Council, the Social Science Research Council, the American Council on Education, and the American Council of Learned Societies. They were intermediaries between those who determined research content and those who exercised their academic freedom by choosing to do the work so determined. The contracting-out system which they had begun administering came fully into bloom under the military administration of research during World War II, when policy set in the Office of Scientific Research and Development (OSRD) relied on contractual arrangements with university-based organizations to do the actual wartime research and development.[22] This method of contractual arrangements was simply continued after the war, and OSRD’s central laboratories were developed into research centers operated by civilians under civilian management, but funded by the military.[23]

With the official declaration of World War II, the United States entered a 34-year war which had its official termination April 30 of last year.[24] Consequently, both physical and social sciences have been heavily organized by the military arm of government with a continuity not achieved before the post-World War II



period. The Southeast Asia War began the same year World War II ended[25], with its Korean War phase beginning in 1950.[26] That was also the year of the first U.S. Military Assistance Group’s arrival in Viet Nam, and the year following the October 1949 victory of the revolutionary movement in China. European-style colonialism could no longer be sustained in that part of the world; it was routed by the power of people’s war. From the point of view of U.S. strategists, the new enemy was “insurgency,” and a novel weaponry was soon to be developed to counter it. Social science work was to play a key part in the production of the counterinsurgency technology of the 1960s and 1970s.

Social Science for Counterinsurgency

The counterinsurgency part of the story begins with the Office of Research and Inventions (ORI), successor to the wartime OSRD. ORI was established in May 1945 for purposes of “retention of the best scientific minds for the Navy team”[27] so that the U.S. could develop capability in science areas “which were formerly European monopolies. For future emergencies, it was necessary to be self-sufficient in all fields of science.”[28] ORI was to administer the principal federal financing for basic research in the physical and social sciences, mainly through contracts with universities, of course, until some other arrangement could be devised whose appearance was more consonant with the doctrine of academic freedom. Congress changed ORI’s name to the Office of Naval Research (ONR) in 1946 and assigned it the responsibility to support “basic research in the many scien-

tific fields of interest to the Navy.”[29] Even though the National Science Foundation was put together in 1950 to handle basic research exclusively, it has in no year (since figures on research expenditures have become publically available) exceeded the Department of Defense’s (DOD) expenditures for basic research in the social sciences.[30] And within the DOD, it has been the ONR which has supported the research on human behavior which has been germinal to counterinsurgency social science.

Normal man . . . is the pivotal point of ONR’s research in human resources . . . The problem is to gain a more complete understanding of normal man’s relation to man, to a group, to supervision, and to the machines he operates . . . The human relations program is aimed at knowing more about the basic determinants of group behavior. ONR psychologists are seeking to find the relationship of human perception, values, ideas, and motivations to behavioral outcomes. [31]

And indeed, the social science work which resulted from the Navy’s organizing effort is the founding body of work in the main tradition of social psychology: the study of the small group.

The Navy organized the work by having an advisory panel of prominent academicians in the relevant fields [32] review the research proposals in the behavioral sciences and recommend research programs and funding “that will most effectively serve the fundamental interests of the Navy”[33] in five specific areas: (1) comparative study of cultures, (2) structure and function of groups, (3) communication of ideas, policies, and values, (4) the nature of leadership, and (5) growth and development of the individual. Five years after its inception, an organizing conference was held in which work done in the program between 1945 and 1950 was detailed in one place in public for the first time. It was hoped that publication of the conference proceedings in the form of a book called *Groups, Leadership, and Men* would “have some impact in shaping research in the social sciences elsewhere by setting forth our strengths and weaknesses in these various projects.”[34] The various projects included much of the classic work in social psychology which graduate students must study to become knowledgeable in the field: Raymond Cattell on morale and leadership measurement; Leon Festinger on informal communication in small groups; John French on group productivity; Solomon Asch on the effects of group pressure on judgments, David McClelland on achievement motivation.

Here we have the height of academic freedom. The ONR maintained a “network of contracts with universities, research laboratories, and industrial institutions . . . [to generate] fundamental studies in science.”[35] Proposals usually originated with the contracting scientists, were evaluated by the ONR, and if accepted, “the contractor is given almost a free rein in completing the study.”[36] The academic worker’s freedom to do the

jobs the ruling class needs done is the working class person’s freedom of choice to starve if working in the ruling class’ industrial or any other sector is repugnant. There seems to be something about the freedom of academia that conceals from view the consideration that “ultimately the basic research must be translated to a form of social technology with reasonable utility.”[37] For the control of whom? By whom? Who consumes the products of the academic’s intellectual labor? Consumption is claimed to be uncontrolled, as if the product were purveyed on supermarket shelves alongside ITT’s Wonder Bread. It is said to be unfortunate that sometimes a customer full of evil comes along and bends the work to evil purposes, but that’s the price of having an intellectual work marketplace, which we all agree is the free way to do business. Compared with the social relations of production between serfs and landlords in medieval Europe, the marketplace type of commercial relation was named “free”. “Free” is an historical label which denotes a specific relationship of production characteristic of the capitalist mode of production; we are free to sell our capacity to work instead of having it bound to the use of a specific landlord. Broadly speaking, only that research work appears on the marketplace which ruling-class sources have determined should be done. So the problem is not an occasional evil consumer at all, but rather that the content of research work overall is determined by the class which owns the wealth of the society.

As the ONR was temporarily carrying much of the administration of academic social science for the military, the Secretaries of War and of the Navy ordered Vannevar Bush, an electrical engineer who had been involved in the development of radar and in the Manhattan Project, to reorganize the government’s methods for getting science work done. On the basis of his experience as director of the wartime OSRD, Bush had authored *Science: The Endless Frontier*,[38] the government’s official postwar document calling for extension of government organization of science work. When the National Security Act of 1947 (which brought into being the Central Intelligence Agency, the Department of Defense, and the Defense Research and Development Board) was enacted into law, the Defense Research and Development Board was established on the lines worked out by Bush.

The Board’s mission included the preparation of an integrated military research and development program, rendering advice on trends in scientific research of relevance to national defense, and recommending measures of interservice coordination and allocation of responsibilities. [39]

The bureaucracy set up in the Board consisted of sixteen committees, whose members were principally military personnel from the three services. One of them was the Committee on Human Resources, whose business it was to “establish a defense-wide social science research program.”[40] Each Committee did its work through a series of panels of government and nongovernmental



scientists who rendered their expert judgment on the scientific work to be undertaken. Panels in human resources included personnel, human relations and morale, human engineering, manpower, training, and psychological warfare.

The Board's work resulted in the proliferation of military institutions for the organization of the intellectual work of social scientists. Before the 1940s were over, the Air Force had set up the RAND (Research AND Development) Corporation and three other research establishments: the Human Resources Research Center, Laboratory, and Institute. They and the Army's Operations Research Office (ORO) at Johns Hopkins University (set up in 1948) and its Human Resources Research Office (HumRRO) at George Washington University (set up in 1951), together carried out most of the military's on-site social science research in Korea during the 1950-1954 war there. Studies were done there on psychological warfare, prisoners of war, racial integration in the Army, and various aspects of human behavior under combat conditions. Soon to become a hotbed of social science counterinsurgency, HumRRO would be an explicit target of the U.S. antiwar movement.

Meanwhile, in 1950 the first U.S. military units were landing in Viet Nam to advance the perimeter of U.S. client states. Their adversaries were fighting guerrilla war. During World War II the British had been the experts in counterinsurgency. Perhaps this was one of the European monopolies the U.S. wanted to break after World War II. Both the Korean War and the French-American Indochina War officially began in 1950 and officially ended in 1954. The conference convened in Geneva to write a treaty for the former ended up writing a treaty for the latter. The two wars taught the U.S. military two lessons: Korea demonstrated that U.S. atomic power was useless in a land war; Viet Nam showed that conventional military techniques would not hold empire territory against people's war. Together, these combat experiences resulted in the development of a new strategic conception, a transition from the massive-retaliation strategy of the Eisenhower-Dulles period to the limited-war strategy of the Kennedy et al. period.[41] It was at this time that the organization of the intellectual workforce for the production of a counterinsurgency technology had its quiet beginnings in the U.S.

The 1947 Defense Research and Development Board was the first centralized postwar body for physical and social science research planning for the military. Since 1958, this board, which is the conceptual heir of the wartime OSRD, has had a central military science (both social and physical) planning body called the Directorate of Defense Research and Engineering (DDRE). It was the DDRE which headed the apparatus which produced the infamous Project CAMELOT.

Development of Project CAMELOT

The DDRE "initiated a series of studies on the state of psychology and the social sciences in the defense estab-

lishment." These studies were completed in 1959 by a Smithsonian Institution research group headed by Charles W. Bray, formerly of the Applied Psychology Panel of the National Research Council during World War II and later the Director of the Air Force Personnel and Training Research Center.

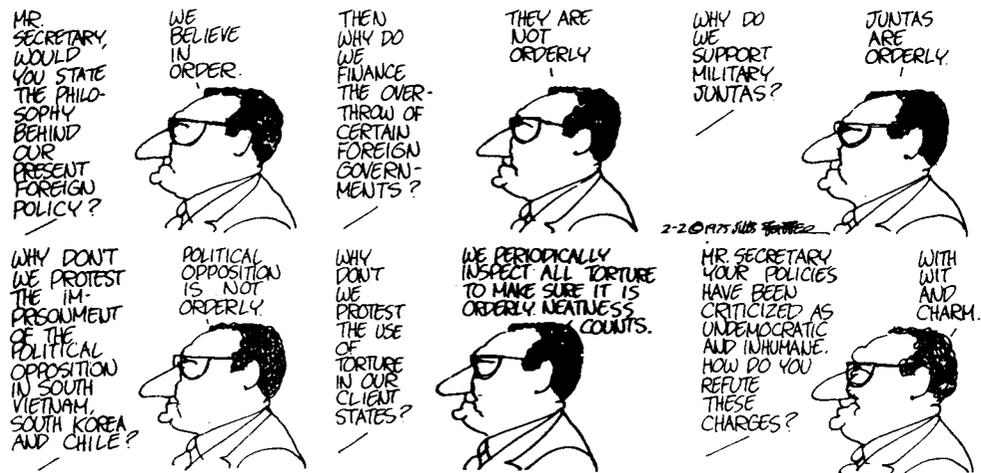
The research group had a steering committee and a series of task panels whose members came from a wide range of academic institutions and had considerable experience in government, particularly military, research. The panels reviewed the state of research in six different fields: the design and use of man-machine systems; the capabilities and limitations of human performance; decision processes in the individual; team functions; the adaptation of complex organizations to changing demands; and persuasion and motivation.[42]

In the group's communique to the academic community, Bray said that they had undertaken to determine the

research on human behavior required to meet long-range needs of the Department of Defense . . . What kinds of problems will the Defense Department face in the future for which research in psychology and the social sciences may help to provide the answers? How would the products of successful research be put to use? . . . Defense managers do not now have the basis for sophistication and inventiveness about people that they have . . . about the production or the development of weapon hardware. Thus the key concepts behind the reasoning and conclusions expressed here is that Defense management needs a technology of human behavior based on advance in psychology and social sciences . . . including new concepts and attitudes about people — based on advancing scientific methodology.[43]

The Bray group's overall recommendation was for implementation of a systems approach through increased funding of "technologically oriented long-range studies within the general fields of human performance, military organization, and persuasion and motivation,"[44] coupled with contracts for large numbers of small-scale studies. The basic research of concern included such mainstream psychological issues as interpersonal relations, social perception, and group psychology, along with a heavy emphasis on team performance, composition, organization and training. They also wanted to know "all that can be known about persuasion . . . the complexity of attitudes and their relation to behavior . . . Military support should seek to integrate basic and applied research in the pursuit of a technology of persuasion." [45] In order to achieve these goals, the study recommended providing

. . . relatively few capable scientists with superb facilities, adequate interdisciplinary and technical help, and continuity of support. The need is to



instill in the key scientists involved a desire to improve national defense through systematic technological development of their subjects and to support them in a manner adequate to their task. [46]

The DOD accepted the Bray group's recommendations and ordered the Army's Advanced Research Projects Agency (ARPA) to put them into operation in 1961 — the year of the first large build-up of U.S. combat troops in Viet Nam and the initiation of the new strategy of limited land war in Southeast Asia. ARPA established a Behavioral Sciences Council to continue with research on persuasion, motivation, and social change in the neo-colonial countries. Meanwhile, Ithiel de Sola Pool (M.I.T.), J.L. Kennedy (Princeton), K. Knorr (Princeton) and C.A.H. Thompson (Rand) organized a second Smithsonian panel which worked for three years under military contract on the question:

How can a branch of social science be produced which takes upon itself a responsible concern for national security matters, and how can talented individuals from within social science be drawn into this area: That this is feasible and deserves to be attempted is a thesis underlying the efforts of the committee which produced this volume. [47]

Its report laid the groundwork for a social science of counterinsurgency. It states that modern warfare is a matter of "gigantic organizations" engaged in "intercultural operations," social science would be needed to find out "how to reach men of particular cultures, ideologies, and personalities" in countries "at the edge or over the edge of insurgency," the counterinsurgency task was nation-building:

an adequate communication system, a growing economy, faith in progress, a set of political parties and pressure groups working toward national goals, a disciplined civil service, a sound currency, literacy, an education system, an honest government, and a modern ideology . . . Hence we conclude that in an age of automatic weapons military men must deal with more social relations problems,

not fewer. And more, the human dimensions have become so complex that intuition alone is no longer capable of dealing with them. Science is called for. [48]

With this in mind a three-part strategy was worked out that would: (1) describe the military's tasks and indicate the appropriate research, (2) focus military and social scientific attention on the tasks and (3) fund and institutionalize the research and recruit intellectual workers and consumers for its products.

This report also outlined ways in which social science research could be of use to the intelligence agencies: By studying aspects

(a) of the capabilities, practices, and objectives of states in international affairs and (b) of the domestic structures and functions (whether political, social or cultural) with which these international capabilities, practices, and objectives are reciprocally related . . . Much of the information produced by social scientists is of immediate use to intelligence, even to the extent that social scientists do not generate information about aspects of the environment that are of prime concern in intelligence. However, it is social science methods of gathering data, deducing data from other data, and of establishing the validity of data that are of particular value — in principle at least — in producing appropriate kinds of information for intelligence. [49]

Finally the Pool group spelled out how academic social scientists could work in counterinsurgency planning with the military. Their analysis said that

the study of internal war is bound to be largely symptomatology, concerned with the discovery of symptoms indicating, with a high degree of accuracy, that internal war will occur in the society's future. [50]

The most important problems internal wars raise are precisely those we now study least: (a) how to anticipate internal wars (that is, . . . the precondi-

tions of internal wars), (b) how to prevent them, and (c) what to do after hostilities cease. Of those problems, the first two are obviously the more important. If they are solved, the third need never arise.[51]

“Internal war” is military euphemism for revolution, civil war, rebellion, guerrilla warfare, coup d’etat, terrorism and insurrection. U.S. counterinsurgency social scientists define internal wars as the use of “violence to achieve purposes which can be achieved without violence,”[52] thus missing completely the development of the contradiction between imperialism and liberation struggles in all of the areas of Southeast Asia formerly colonized by France. Counterinsurgency strategy dictates that early detection of the potential for armed struggle among the people of a country is critical for subverting that struggle, and is thus an attempt at a technological solution to a problem whose only solution can be political. A people organizes for armed struggle only when its goal cannot be achieved in any other way. At such a time, only destruction of the *ancien regime* and revolutionary transformation of the relations of production — a political solution — will alleviate the “preconditions of internal war.”

But the organizers of social science work believed they could create a technology of social surveillance which would give the U.S. ruling class pre-emptive strike capacity. What Pool et al did was to arrange an academic symposium through the Special Operations Research Office (SORO)[53] called “The U.S. Army’s Limited-War Mission and Social Science Research.” This was the DOD’s organizing conference for Project CAMELOT. Some 300 social scientists gathered at the symposium were given the logic of their function as counterinsurgents:

In many developing nations where there is no direct negotiation or military confrontation with our major antagonists, the national interest requires our military participation when the military threat factor is but one of the several important factors to be faced in each situation. Military involvement is required long before events reach the stage when maximum physical force is appropriate or required.

There are military capabilities and skills which in prior wars were either ancillary or subsequent to use of direct physical combat capabilities — psychological operations, unconventional warfare, civic actions, military aid and advice. These capabilities have become the primary components of the military counterinsurgency weapon system, retaining the direct physical combat capabilities in a ready, indispensable, and highly critical reserve status.

Success in the counterinsurgency mission is as much dependent on political, social, economic, and psychological factors as upon purely military factors, and sometimes more so.[54]

Whether one is concerned with programs to alleviate political, social, or economic sources of discontent, with techniques of indirect influence, with the social environment in which actions occur, or with the social and political factors which are targets of action, the kind of underlying knowledge required is the understanding and prediction of human behavior at the individual, political and social group, and society levels. The systematic acquisition of such knowledge is the business of the behavioral and social sciences . . .

In addition to the acquisition of relevant knowledge in the classical scientific sense, scientists must explicitly define the linkage, whether immediate or remote, of the knowledge acquired or being acquired to specific operational problems and continually assess the import of such knowledge to solution of the problem.[53]

Producing the research their employers wanted would involve social science counterinsurgent’s carrying on what they normally did, but within an explicitly stated strategy for application. The social science literature-at-large would be used the way Kennecott uses Chilean copper. Academic social scientists would research and think and publish, and the ruling class would use the results in executing its policies.

Chief of Army Research and Development Lt. Gen. A.G. Trudeau told the symposium audience:

I am concerned about the sociopsychological factors basic to concepts and techniques to be developed for successful organization and control of guerrillas and indigenous peoples by external friendly forces. . . . [emphasis added] [56]

If insurgent strength flowed from the people, then “external forces” clearly had to try to control the people. The Western variety of 20th-century social science was thought to be an appropriate weapon to achieve this objective.

[We need] systems of control to manage conflicts at a rational level . . . The problem, after all, is to achieve objectives on the social groupings, by means of social groupings. There is a certain amount of hardware involved, too, of course, but men and their motives are at the heart of the matter.[57]

Winning hearts and minds.

We are in the business of using people. All of us are these days. Some people don’t want to be used. Maybe you can help us solve that one.[58]

But the organizers of the symposium were not merely interested in proposing areas of research. They also wanted now to direct the conduct of that research:

Attack fearlessly and without emotional or ideological distortions the question whether the means on which we rely to cope with the sources of turbu-

lence in the new nations are adequate, whether we can steal our enemies' thunder.[59]

Social science offers, through the disinterested collection of data and analysis of behavior, the most reliable information we have about human institutions.[60]

And finally, from the Army's Chief of the Office of Research and Development:

We feel that a military social science research program will receive long-term support only if it emphasizes the conduct of research and refrains from journalistic comment on world affairs.[61]

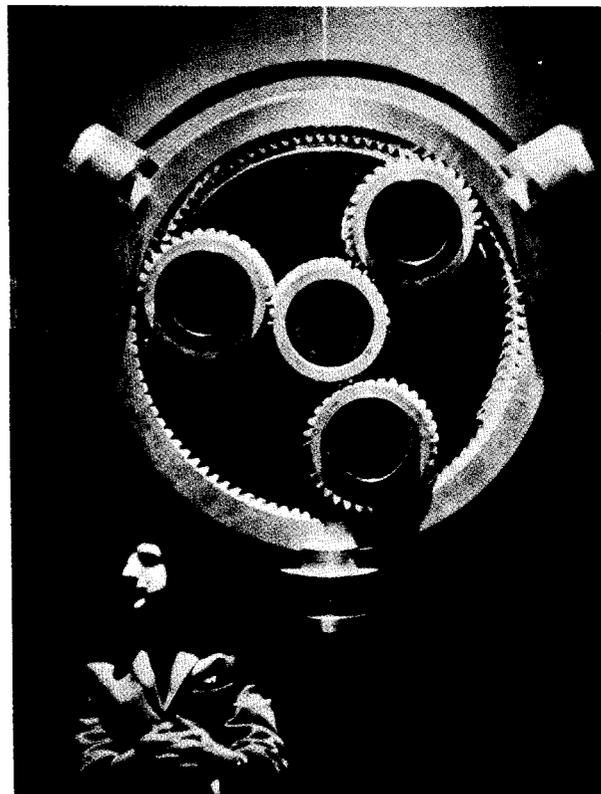
In other words, the social scientists at this symposium were to have the freedom to do the required work if they wanted to, but they were not supposed to turn their inspection apparatus to the question of how they as human beings were acting in human society. For that would not be value-free social science. The claim that positivist methodology unearthed unbiased social knowledge is itself an item of dispute, but the injunction to separate the social function of their work from its content is an attempt to perform bloodless psychosurgery on the academic mind.

The SORO symposium created the population for take-off into a centrally organized, massive social science enterprise to gather data for counterinsurgency. Once that was accomplished the creation of CAMELOT was itself simple and could be handled through bureaucratic channels: the Defense Science Board took the Pool-Smithsonian report and in the spring of 1964 created a subcommittee to decide how to implement its recommendations.

In March 1965 the Army was instructed to establish a "centrally coordinated applied-research effort" in the Washington D.C. area on behalf of the DOD. At the same time, ARPA was given the responsibility for organizing "supporting research in the universities," in accord with guidelines spelled out by the Defense Science Board report. In addition, the Air Force, Navy and ARPA would be involved in "smaller related research efforts," complementary to that outlined above.[62] The centrally coordinated applied-research effort in the behavioral and social sciences was Project CAMELOT,

a study whose objective is to determine the feasibility of developing a general social systems model which would make it possible to predict and influence politically significant aspects of social change in the developing nations of the world.[63]

Selected academics were invited, in August 1964, to a month-long meeting to be held in August 1965 in order to review the research design. August, 1964, it must be remembered, was when the Tonkin Gulf incident was staged. Instead of accepting its evident military defeat in Viet Nam, the U.S. secured the official sanction of Congress to throw almost its whole army against the people of Viet Nam. Counterinsurgency was about to get



its first full-scale field test. The Army's SORO was to administer the espionage work of gathering the social science data which would be the content of CAMELOT and the CAMELOT conception was to be the secret of control without B-52 bombing. But neither social scientists nor B-52 bombers could halt the struggle for liberation that the Vietnamese people had been waging for decades.

In 1965 CAMELOT was accidentally exposed and several layers of administration between the DOD and its social science operatives had to be elaborated to clean up its appearance, but its work proceeded as planned. Perhaps the main consequence of CAMELOT's exposure and supposed termination was a proliferation of studies on how to organize the military social science work deemed necessary without risk of such embarrassment.[64] The social-systems simulation modeling for which CAMELOT was to have been the feasibility study had by the time of this writing become fully operative in the arsenal of the U.S. ruling class and was used in the 1973 coup in Chile which restored U.S. hegemony over that country's economy.[65]

Since 1965 the resources formerly allocated for CAMELOT have been used "to redesign research tasks" concerned with measuring insurgency potential and determining how "military assistance and allied programs can have increased effectiveness."

The initial objective will be to develop a research plan that will specify those research tasks necessary

to ultimately identify the parameters significant in detecting social unrest which leads to Communist penetration of the society and potential Communist-inspired revolt in developing nations . . . [66]

FOOTNOTES

Conclusion

What this essay has sought to establish is that from the beginning the social sciences in the U.S. were guided by the needs of the owners of North American industry to manage the social relations of capitalist production and to control markets and resources on a global scale. It examines only one of the processes of integration between the social sciences and capitalist priorities — that which results from the central government's requirements for a technology of population management. Originally, federal organization of the social sciences meant the invention of social devices to monitor the immigrant labor force, acculturate it, and exterminate the tendency to socialist organization imported in its baggage. Later, as the U.S. engaged in struggles against its capitalist rivals and moved to displace European powers by reestablishing imperial domain on a supposedly more workable basis, the social science establishment turned its efforts to figuring out how to subvert popular movements that opposed foreign control and exploitation.

The social sciences are servomechanisms to the administrative institutions of the military, political, and economic sectors of Western capitalism, but at no point have these interests made their hegemony over the general thrust of social science research overt. Intellectual workers have been able to believe that they are attracted to particular lines of scientific inquiry purely on the basis of their intrinsic merits. The means of control are subtle. Our question, then, is how to rattle the tight complacency of the academic's world: how to subvert the smooth operation of its ideological and practical control. Obviously, one line of struggle is to blast away the murky fog which conceals the mechanisms of control. This essay is intended to contribute to that enterprise.

An equally necessary contribution, though, is to thoroughly abandon the bourgeois mode of doing social science research work. At its core, that means shifting the ownership of the products of our intellectual work from the ruling class to some sector(s) of the working class. If our social science research work were to be dictated by the practical needs of political work we were engaged in with others, then its products would automatically be appropriated by some element of the class whose historical role we share. "The Literature" would have to be abandoned as a repository of our research products; it's a ruling class depot every bit as alienated from working class access as a Cargill grain elevator.

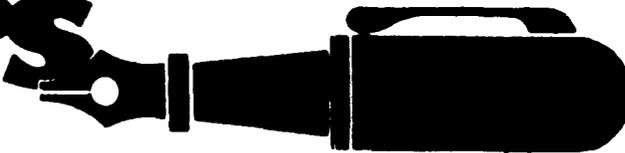
No science work has ever been value-free; every piece of science work is done in behalf of a social class. It's clear that we have to get a lot more clearer about how to do science for our class.

Carol Cina

1. In 1958, the National Science Foundation (NSF) reported that possibly as much as two-thirds of the expenditures for research and development performed by colleges and universities comes today from the Federal Government." (NSF, *Government-University Relationships in Federally Sponsored Scientific Research and Development*, Washington D.C.: Government Printing Office, April 1958, p.1). In 1973, about 70% of research and development in universities and colleges was being paid for through the Federal Government. (NSF, *Expenditures for Scientific and Engineering Activities at Universities and Colleges, Fiscal Year 1973*, Washington D.C.: Government Printing Office, July 1975).
2. I am indebted to David Eakins (*The development of corporate liberal policy research in the United States*, Ann Arbor, Mich.: University Microfilms, No. 66-9/902, 1966) for his extensive archival research on the facts of the formation of the early policy research organizations, and especially for the fact that the new political economists transmitted the ideas of Bismarck's welfare state to the United States.
3. The book first to elaborate the concept of corporate liberalism was James Weinstein's *The corporate ideal in the liberal state 1900-1918*, Boston: Beacon Press, 1968.
4. E.g., Richard T. Ely, Edmund J. James, E.A. Seligman, Henry C. Adams, Henry Farnam, Simon Patten, and John Bates Clark.
5. Franks, P.A. *A Social History of Social Psychology*. Unpublished doctoral dissertation, State University of New York at Stony Brook, 1975; Ann Arbor, Mich.: University Microfilms.
6. Eakins, D. *op. cit.*, p.115.
7. Council for National Defense, National Research Council. *Basis of Organization and Means of Co-operation with State Councils of Defense*. Wash. D.C.: May 1, 1917, pp. 1-2.
8. Report of the National Research Council, 1916. In *Report of the National Academy of Sciences*. Wash. D.C.: Government Printing Office, 1916, p. 32.
9. Council of National Defense, National Research Council. *op. cit.*, p. 11.
10. National Research Council. *Consolidated report upon the activities of the NRC 1919 to 1932*. The Carnegie and Rockefeller groups continued to supply substantial support, including a Carnegie purchase of a building on Constitution Avenue in Washington to house the Council's offices.
11. *Third annual report of the National Research Council*. Washington D.C.: Government Printing Office, 1919.
12. *Ibid.*, p. 25.
13. *Ibid.*
14. National Research Council, *Consolidated Report, op. cit.*, p. 67.
15. Third Annual Report of the National Research Council. In *Report of the National Academy of Sciences*. Wash. D.C.: Government Printing Office, 1918, p. 42.
16. The surveying agency was called the Research Information Service.
17. Eakins, D. *Op. cit.*, chapter 5.
18. *Recent social trends in the United States*. Report of the President's Research Committee on Social Trends. New York: McGraw-Hill, 1933, 2 vols., pp. 5 and lxxi.
19. *Ibid.*, p.lxii.

20. *Research—a national resource*. Report of the Science Committee to the National Resources Committee. (3 vols). Part I: Relation of the federal government to research.
21. *Ibid.*, p. 16.
22. National Science Foundation. *Organization of the federal government for scientific activities*. Wash. D.C.: Government Printing Office, 1956, p.3.
23. Bush, V. *Science: The endless frontier*. Wash. D.C., 1945 (NSF reprint, July 1960), xiii.
24. Which is not to suggest that the Viet Nam War is the last of the series. See "The Great South Asian War — Mercenary Strategy for the Endless War," in Michael T. Klare, *War Without End: American Planning for the Next Vietnams*, New York, Vintage Books, 1972, for a discussion of the Pacific Basin economic holdings which necessitate continuing military action in that region.
25. See, e.g., Harold Isaacs, "Independence for Vietnam?" In Marvin E. Gettleman, Ed. *Vietnam: History, Documents and Opinions on a Major World Crisis*, New York, Fawcett, 1965, pp. 37-55.
26. See I.F. Stone, *The Hidden History of the Korean War*, New York, Monthly Review Press, 1952.
27. Office of Naval Research. *Annual Report, fiscal year 1950*. Wash. D.C.: Department of the Navy, 1950, p.1.
28. *Ibid.*
29. National Science Foundation (NSF 69-3), 1969. *The behavioral Sciences and the Federal Government*. Report of the
30. National Science Foundation. *Federal funds for research, development, and other scientific activities* (title varies). Washington, D.C.: Government Printing Office, annually 1956-71.
31. Office of Naval Research. *Annual Report, op. cit.*, pp. 15-16.
32. The advisory panel consisted of Margaret Mead, Columbia University; John G. Darley, University of Minnesota; Pendleton Harris, Social Science Research Council; E. Lowell Kelly, University of Michigan; Rensis Likert, University of Michigan; George Lombard, Harvard University; F.F. Stephan, Princeton University; George Saslow, Washington University in St. Louis; Jerome Pataky, Navy; and J.S. Bruner, Harvard University. Past Panel members had been E. Wight Bakke, Yale University; Ruth Benedict, Columbia University; Erich Fromm, Bennington College; John Jenkins, University of Maryland; Alexander Leighton, Cornell University; Kurt Lewin, Director, Research Center for Group Dynamics, Massachusetts Institute of Technology; Dael Wolffe, American Psychological Association official; and Dexter Keez .cGraw-Hill book company.
33. Guetzkow, H. (Ed.) *Groups, leadership and men*. New York: Russell & Russell, 1963 (originally published in Pittsburgh by the Carnegie Press, 1951), p.3.
34. *Ibid.*, p.4.
35. Office of Naval Research. *Annual Report, 1950. Op. cit.*, p.4.
36. *Ibid.*
37. Guetzkow, H. (Ed.) *Groups, leadership and men. Op. cit.*, p.4.
38. *Op. cit.*
39. National Science Foundation. *Organization of the federal government for scientific activities. Op. cit.*, p.9.
40. Lyons, G. *The uneasy partnership: Social science and the federal government in the twentieth century*. New York: Russell Sage Foundation, 1969, p.137.
41. Klare, M., *Op. cit.*, chapter 1.
42. *The uneasy partnership, Op. cit.*, pp. 148-149.
43. Broy, C.W. Toward a technology of human behavior for defense use. *The American Psychologist*, 17, August 1962, pp. 527-529.
44. *Ibid.*, p.527.
45. *Ibid.*, pp.538-540.
46. *Ibid.*, p.541.
47. Pool, I. de S. et al. *Social science research and national security*. Wash. D.C.: Smithsonian Institution, March 5, 1963, p. 10.
48. *Ibid.*, pp. 7-10.
49. *Ibid.*, 79-80.
50. *Ibid.*, p. 84.
51. *Ibid*, p. 109.
52. *Ibid.*, p. 102.
53. The Army's social science counterinsurgency research center, established at the American University in Wash. D.C. in 1956. Its name was changed to Center for Research in Social Systems (CRESS) in 1966. Resistance from within academia caused it to be phased out as a federally funded research and development center at the end of fiscal year 1970; its cover was switched from American University to the American Institute for Research (AIR).
54. Special Operations Research Office. *Symposium proceedings: The U.S. Army's limited-war mission and social science research, March 26, 27, 28, 1962*. Wash. D.C.: The American University, June 1962, pp.v-vii.
55. *Ibid.*, pp.x-xii.
56. *Ibid.*, p. 16.
57. *Ibid.*, p. 48.
58. *Ibid.*, pp. 88-89.
59. *Ibid.*, p.171.
60. *Ibid.*, p.181.
61. *Ibid.*, p.359.
62. U.S. House of Representatives. *Behavioral sciences and the national security*. Committee on Foreign Affairs. Hearings, Part 9, 89th Congress, 2nd Session, 1966, pp. 72-74.
63. Horowitz, I.L. (ed.) *The rise and fall of Project Camelot*. Cambridge, Mass.: The MIT Press, 1967, p.47.
64. *The behavioral and social sciences: Outlook and needs*. Report by the Behavioral and Social Sciences Survey Committee. Wash. D.C.: National Academy of Sciences, 1969. *Knowledge into action: Improving the nation's use of the social sciences*. Report of the Special Commission on the Social Sciences. Wash. D.C.: National Science Board—National Science Foundation (NSF 69-3), 1969. *The behavioral sciences and the federal government*. Report of the Advisory Committee on Government Programs in the Behavioral Sciences. Wash., D.C.: National Academy of Sciences (NAS Publication 1680), 1968. *Behavioral and social science research in the Department of Defense: A framework for management*. Report of the Advisory Committee on the Management of Behavioral Science Research in the Department of Defense, Division of Behavioral Sciences, National Research Council, Wash. D.C.: National Academy of Sciences, 1971.
65. North American Congress on Latin America. *Latin America and empire report, VIII (6)*, July-August 1974. See also Fred Landis, *The CIA Makes Headlines, Liberation*, March/April 1975. Also, *Social Psychology, Simulation Modelling, and U.S. Neocolonialism, Psych-Aggregator*, Fall 1975 (available upon request from *Psych-Aggregator*, Psychology Department, State University of New York, Stony Brook, N.Y. 11794).
66. U.S. House of Representatives. *Behavioral Science and the National Security, op. cit.*, pp.32-33.

letters



To whom this may concern:

I'm interested in your journal. I'm also a scientist looking for alternatives to prostituting myself to government and corporations. I want to give my energy and expertise to the people. If you can provide in any way realistic options for me I would appreciate your input. I'm a biochemist and plan to receive my doctorate within the next year.

I would appreciate any way you can help.

Mike Dunn
Zephyrhills, Fla.

Dear Mike,

I'm sorry it has taken me so long to reply to your letter, but we depend on volunteer labor and there always seems to be more work than hands to do it. Since I'm also a biochemist, (just got a job as an assist. prof. at Tufts) I was asked to write to you. It is a difficult problem — finding some way to make use of our knowledge and our skills to serve *all* the people, and not just some privileged sector or only ourselves.

Many of us in Science for the People are trying to deal with this problem in terms of our own choices and certainly there is no unanimity of opinion among us. Some individuals would say that the only honest solution is to leave our professional positions and to work with working class people, to share their lives and to try to help them organize themselves to change this society. Although that position *has some truth to it*, I don't feel it is a general solution for all of us.

At this point in time, I don't feel that there is only one strategy or route. What is important is that we deal with our disaffection in some meaningful manner. For me, that involves learning about and analyzing the nature of this society, struggling to alter the society and developing some vision of what a more just society would look like. I think we have an important role to play as scientists for we must be able to work within the scientific community to combat the use of science and technology against the people's struggle. For example, the battle against psychosurgery and behavior modification in prisons has been an important effort and a relatively successful one. Monitoring and fighting against the misuse of the findings of fields such as genetic engineering and sociobiology are areas in which Science for the People is actively engaged. Developing a new "people's science" is certainly also an important task, but one which Science for the people has not been very actively engaged in. Some of us are rather unsure of the real potential of alternative technologies for effecting meaningful social change, but I

think this is an area we shall have to deal with more seriously in the future.

If you are finishing up graduate school, you already have a large base of technical knowledge to work from. Now you can build on that base to learn about some areas such as nutrition, genetic engineering, sociobiology, health care, the drug industry, agribusiness, etc. From there you will have to discover how to use this information for the benefit of the people. Carry out education, develop a "people's science," fight against the misuse of these areas. (In Florida, the citrus industry might be one focal point.) Pick a research topic you can somehow integrate into your politics (occupational health?) and if that is impossible, pick a topic that you can at least justify as doing some good for people.

My last comment may be the most difficult to follow through, but it is the most important. And that is the imperative of *collective action*. Find other people, talk together, learn together and work together. As an individual you are an isolated entity, but as a part of a collective you acquire strength. I'm enclosing a description of our organization which includes a literature list and a listing of the various activity groups. If you have any questions or need any help write to me or to any group that interests you . . . we promise to reply (even if a little late).

In struggle,
Ross S. Feldberg

Dear people,

I am a senior at Brown University, majoring in physics and math, at which I have done well. I am also a "radical," half Marxist and half along the lines of Blake-Mumford-T. Roszak. I have been disillusioned with the prospect of a scientific "career" — at worst, such a career would seem to make things worse (such as bomb physics), at best (such as teaching math) a career wouldn't make things worse but doesn't make things better.

It would seem that the proper thing to do is work for the people, rather than the elite, as most intellectuals do. But I don't know *how*. So I am writing to ask if you have any ideas on whether there are any scientific "careers" that are worthwhile and politically relevant.

This year, I am taking courses in Environmental Science. Nonetheless, I fear that *that* field is mostly helping - capitalism - to - expand - obnoxiously - but - just - not - bad - enough - to - collapse. So what if new factories pollute 10% less? I've wondered — are there any worthwhile radical environmental groups; are there

groups working on alternative energy sources and simple machines that could enable people to do things for themselves, rather than depend on large corporations; are there groups that bring practical scientific knowledge to the people who need it — any group truly deserving the title “Science for the People?” If you have any suggestions, or know of any such groups, please let me know.

Thank you,
Sanford Sillman
Providence, R.I.

Dear Sanford:

It was good to get your letter. What you are experiencing is something that many of us have also felt. It is one of the main reasons why Science for the People was formed. However, I think that most of us have discovered that not only is it nearly impossible to find a job which is “worthwhile and politically relevant,” but it is not through our careers that this society will be changed to allow science to serve the people. What is called for is political action at the side of working people, something you will most likely do outside your job. (We don’t get paid for that in America.)

This does not mean that your studies cannot be put to good use. You mention Environmental Science. There are more and more struggles which have a scientific component. You can contribute by demystifying the science involved, exposing the class-bias of the science, winning over other scientific workers, giving technical advice — besides taking part in general political action. This is what Science for the People does, contributes to people’s struggles which will eventually change the system. Of course, there are other groups which try to do useful science, like developing alternate energy sources. They make a few people feel good, but they do nothing to confront the system which controls our economy and our lives.

I think you would find it interesting to see how science can develop and be used when the exploiting class has been removed. We sent a delegation to China and they have written a very good book (*China: Science Walks on Two Legs*, \$1.75) about science at the service of the people.

Jobs are hard to locate. Settle down somewhere where you can do some political work and maybe you will make contact with a good job. Try to do beneficial science where you can, but only through a long political struggle will we make it the rule, not exception.

Yours in the struggle,
Mike Teel
Boston

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ABOUT THIS ISSUE cont.

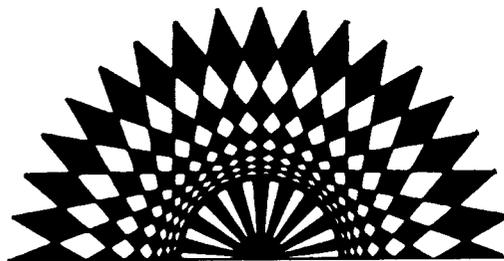
new breed of sociobiologists who claim that the *status quo* is an evolutionary inevitability.

Science for the People has been active in exposing the use of scientific research for the control and oppression of people in this country and throughout the world. We began some six years ago during the Viet Nam War, when we focussed on the military’s use of advanced technology, such as the electronic battlefield. Since then we have become increasingly aware that the U.S. has continued to use science and technology for the exploitation of the people and resources of Third World countries.

Here in the U.S., the class nature of the scientific establishment has led to the perpetuation of sexism among scientists and technical workers: Women in science have not been exempt from the oppression suffered by women in the society at large. Elitism among scientists begins in high school — students learn that only the “most intelligent” can ever hope to understand the mysteries of science, that such matters are best left to the “experts.” These divisions facilitate capitalist-class control of science.

But we have also learned some good things, some hopeful things. We have seen how science in China has come to serve the people; there the priorities of research reflect the needs of the people and everyone has the opportunity to participate in scientific activities. This optimally utilizes the potential of all the people and, in so doing, demystifies science and provides access to scientific tools for all. A science for the people is being built in China, but this would not have been possible without the armed struggle of the people to overthrow the old social order and to end foreign domination.

We get correspondence from hundreds of people everywhere who have heard of Science for the People or read the magazine. They relate their ideas about scientific issues, their own experiences in laboratories, organizing scientists and technical workers, and engaging in alternative ways of doing science. We must work together steadfastly toward the restructuring of scientific work until its products belong to and meet the needs of working people. Here in the U.S., as well, this can finally take place only through extreme social transformation.



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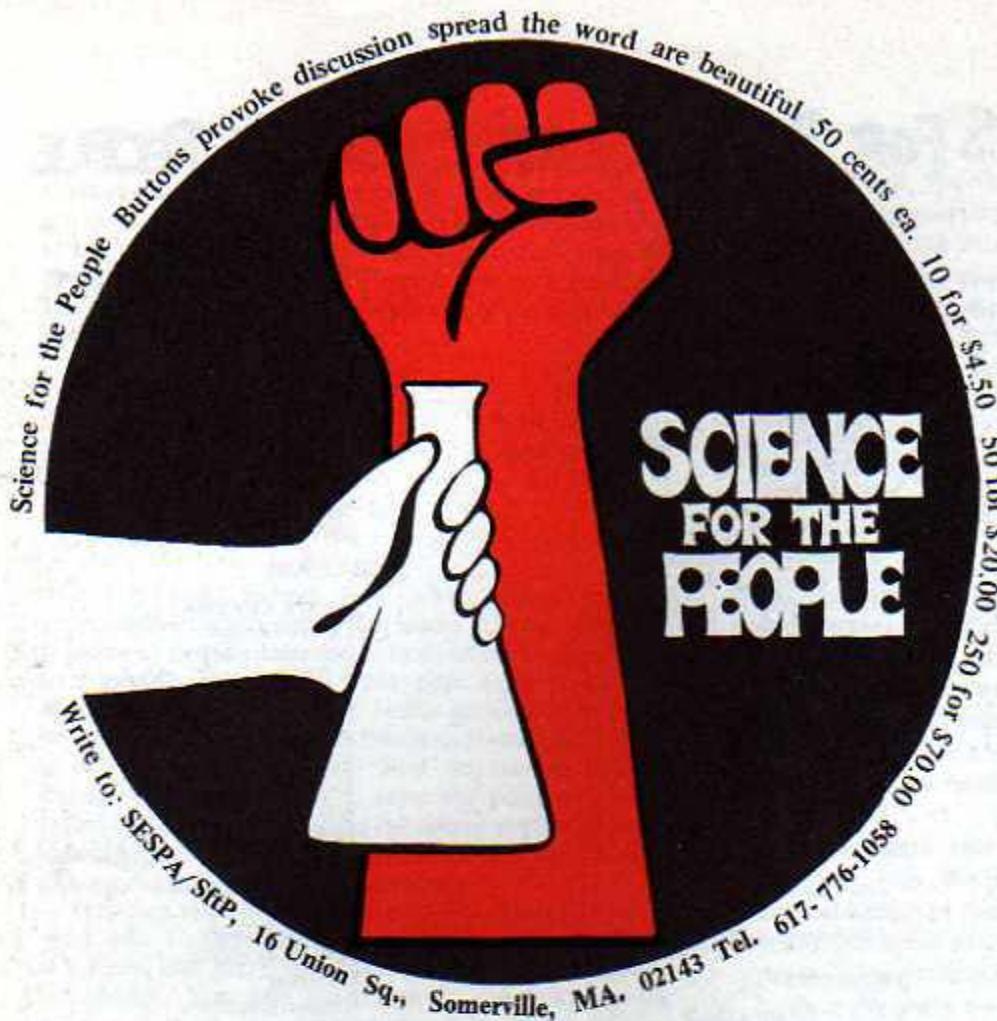
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SUBSCRIPTIONS TO SCIENCE FOR THE PEOPLE AND MEMBERSHIP IN SESPA

SESPA is defined by its activities. People who participate in the (mostly local) activities consider themselves members. Of course, there are people who through a variety of circumstances are not in a position to be active but would like to maintain contact. They also consider themselves members.

The magazine keeps us all in touch. It encourages people who may be isolated, presents examples of activities that are useful to local groups, brings issues and information to the attention of the readers, presents analytical articles and offers a forum for discussion. Hence it is a vital activity of SESPA. It is also the only regular national activity.

We need to know who the members are in order to continue to send *SCIENCE FOR THE PEOPLE* to them. Please supply the following information:

1. Name:

Address:

Telephone:

Occupation:
 (if student or unemployed please indicate)

2. Local SESPA chapter or other group in which I'm

active. (If none, would you like us to help you start one?)

3. I am enclosing money according to the following scheme:

- A. Institutional subscription-\$15 for libraries and others. _____
- B. Individual memberships: (1) regular memberships-\$12, (2) indigent membership-less than \$12, (3) affluent or dedicated revolutionary membership-more than \$12, (4) completely impoverished-nothing, (5) I have already paid. _____

4. I will sell _____ magazines. This can be done on consignment to bookstores and newsstands, to your co-workers, at meetings. (If you want to give some away free because you are organizing and can't pay for them, let us know)

5. I am attaching a list of names and addresses of people who I believe would be interested in the magazine. Please send them complimentary copies.

Please add any comments on the magazine or SESPA or your own circumstances. We welcome criticism, advice, and would like to get to know you.

SEND CHECKS TO: SESPA 16 Union Sq., Somerville, Ma. 02143