

**Science For The
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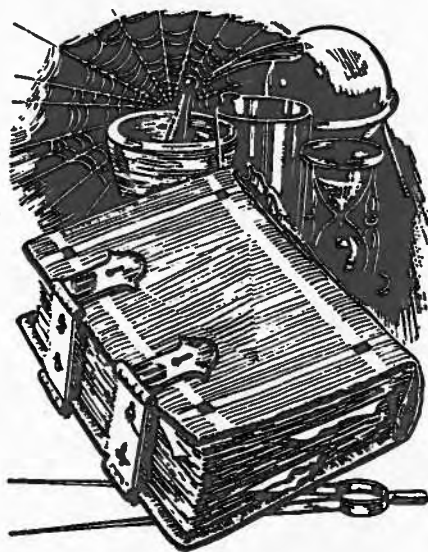
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Towards A Science For The People



In the 15th century Leonardo da Vinci refused to publish plans for a submarine, because he anticipated that it would be used as a weapon. In the 17th century, for similar reasons, Boyle kept secret a poison he had developed. In 1946 Leo Szilard, who had been one of the key developers of the atom bomb, quit physics in disillusionment over the ways in which the government had used his work. By and large this kind of resistance on the part of scientists to the misuse of their research has been very sporadic, from isolated individuals, and generally in opposition only to particular, unusually repugnant projects. As such it has been ineffective. If scientists want to help prevent socially destructive applications of science, they must forego acting in an *ad hoc* or purely moralistic fashion and begin to respond collectively from the vantage point of a political and economic analysis of their work. This analysis must be firmly anchored in an understanding of the American corporate state.

We will argue below that science is inevitably political, and in the context of contemporary American corporate capitalism, that it contributes greatly to the exploitation and oppression of most of the people both in this country and

abroad. We will call for a re-orientation of scientific work and will suggest ways in which scientific workers can re-direct their research to further meaningful social change.

SCIENCE IN CAPITALIST AMERICA

Concurrent with the weakening of Cold War ideology over the past 15 years has been the growing realization on the part of increasing numbers of Americans that a tiny minority of the population, through its wealth and power, controls the major decision-making institutions of our society. Research such as that of Mills (*The Power Elite*), Domhoff (*Who Rules America*), and Lundgren (*The Rich and the Superrich*) has exposed the existence of this minority to public scrutiny. Although the term "ruling class" may have an anachronistic ring to some, we still find it useful to describe that dominant minority that owns and controls the productive economic resources of our society. The means by which the American ruling class exerts control in our society and over much of the Third World has been described in such works as Baran and Sweezy's *Monopoly Capital*, Horowitz's *The Free World Colossus*, and Magdoff's *The Age of Imperialism*. These works argue that it is not a conspiracy, but rather the logical outcome of corporate capitalism that a minority with wealth and power, functioning efficiently within the system to maintain its position, inevitably will oversee the oppression and exploitation of the majority of the people in this country, as well as the more extreme impoverishment and degradation of the people of the Third World. It is within the context of this political-economic system, a system that has produced the Military-Industrial complex as its highest expression, and that will use all the resources at its disposal to maintain its control, that is, within the context of the American corporate state, that we must consider the role played by scientific work.

We view the long-term strategy of the U.S. capitalist class as resting on two basic pillars. The first is the maintenance and strengthening of the international domination of U.S. capital. The principal economic aspect of this lies in continually increasing the profitable opportunities for the export of capital so as to absorb the surplus constantly being generated both internally and abroad. With the growing

revolt of the oppressed peoples of the world, the traditional political and military mechanisms necessary to sustain this imperialist control are disintegrating. More and more the U.S. ruling class is coming to rely openly on technological and military means of mass terror and repression which approach genocide: anti-personnel bombs, napalm, pacification-assassination programs, herbicides and other attempts to induce famines, etc.

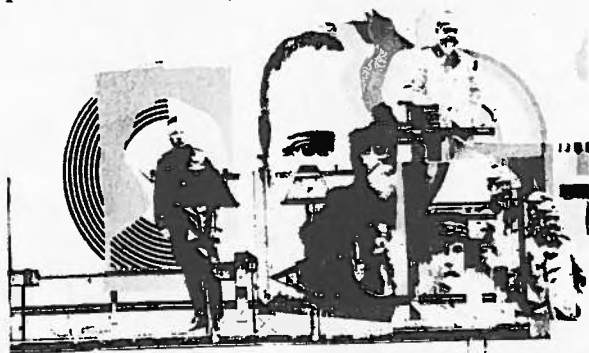
While this use of scientific resources is becoming more clearly evident (witness the crisis of conscience among increasing numbers of young scientists), the importance of scientific and technological resources for the second pillar of capitalist strategy is even more central, although less generally accorded the significance it deserves.

The second fundamental thrust of capitalist political economic strategy is to guarantee a steady and predictable increase in the productivity of domestic labor. The ability to extract an increasingly better return on the wage investment by curtailment of the necessary labor time to produce a given product is crucial to the maintenance of the profitability of domestic industry and its ability to compete on the international market. Without this increase in labor productivity it would be impossible to maintain profits and at the same time sustain the living standard and employment of the working class. This in turn makes it possible to sustain the internal consumer market and to blunt the domestic class struggle in order to preserve social control by the ruling class.

The key to increasing the productivity of American labor is the transformation and re-organization of our major industries through accelerated automation and rationalization of the production process (through economy of scale, the introduction of labor-saving plant and machinery, doing away with the traditional craft prerogatives of the workers, etc., such as is now occurring in the construction industry). This re-organization will depend on programmed advances in technology.

There are basically two reasons why these advances and new developments cannot be left to the "natural" progress of scientific-technological knowledge, why they must be foreseen and included in the social-economic planning of the ruling class. First is the mammoth investment in the

present-day plant, equipment and organizational apparatus of the major monopolies. The sudden obsolescence of a significant part of their apparatus would be an economic disaster which could very well endanger their market position. (One sees the results of this lack of planning in the airline industry.) Secondly, the transformation of the process of production entails major re-organization of education, transportation, and communication. This has far-reaching social and political consequences which cause profound strains in traditional class, race, and sex relationships, which have already generated and will continue to generate political and social crises. For the ruling class to deal with these crises it is necessary to be able to plan ahead, to anticipate new developments so that they do not get out of hand.



In our view, because planning and programmed advances in technology are absolutely central to ruling class strategy, an entirely new relationship is required between the ruling and the technical-scientific sectors of society, a relationship which has been emerging since the Second World War, and which, deeply rooted in social-economic developments, cannot be reversed. If one looks at the new sciences which have developed in this period—cybernetics, systems analysis, management science, linear programming, game theory, as well as the direction of development in the social sciences, one sees an enormous development in the techniques of gathering, processing, organizing, and utilizing information, exactly the type of technological advance most needed by the rulers.

It is no accident that two of the most advanced monopolistic formations, advanced both in their utilization

and support of science and in the efficiency and sophistication of their internal organization, are Bell Telephone and IBM. They represent to capitalist planners the wave of the future, the integration of scientific knowledge, management technique and capital which guarantees the long-term viability of the capitalist order. They also represent industries which are key to the servicing and rationalizing of the basic industries as well as to the maintenance of the international domination of U.S. capital.

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The ruling class, through government, big corporations, and tax-exempt foundations, funds most of our research. In the case of industrial research, the control and direction of research are obvious. With research supported by government or private foundations, controls are somewhat less obvious, but nonetheless effective. Major areas of research may be preferentially funded by direction of Congress or foundation trustees. For example, billions of dollars are spent on space research while pressing domestic needs are given lower priority. We believe that the implications of space research for the military and the profits of the influential aerospace industries are clearly the decisive factors. Within specific areas of research, ruling-class bias is also evident in selection of priorities. For example, in medicine, money has been poured into research on heart disease, cancer and stroke, major killers of the middle and upper classes, rather than into research on sickle cell anemia, the broad range of effects of malnutrition (higher incidences of most diseases), etc., which affect mainly the lower classes. Large sums of money are provided for study of ghetto populations but nothing is available to support studies of how the powerful operate.

Second, on a lower level, decisions on which individual gets research money are usually made by scientists themselves chosen to sit on review panels. The fact that these people are near the tops of their respective scientific hierarchies demonstrates a congruence between their professional goals and the scientific priorities of the ruling class. This kind of internal control is most critical in the social sciences, where questions of ideology are more obviously relevant to what is

considered "appropriate" in topic or in approach. This same scientific elite exerts control over the socialization of science students through funding of training grants to universities, through their influence over curricula and textbook content, and through their personal involvement in the training of the next generation of elite scientists. Thus, through the high level control of the funding now essential for most scientific research, and second, through the professional elites acting in a managerial capacity, ruling-class interests and priorities dominate scientific research and training.

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The same government-corporate axis that funds applied research that is narrowly beneficial to ruling-class interests also supports almost all of our basic or, to use the euphemism, "pure," research; it is called pure because it is ostensibly performed not for specific applications but only to seek the truth. Many scientific workers engaged in some form of basic research do not envision any applications of their work and thus believe themselves absolved of any responsibility for applications. Others perform basic research in hopes that it will lead to the betterment of mankind. In either case these workers have failed to understand the contemporary situation.

Today, basic research is closely followed by those in a position to reap the benefits of its application--the government and the corporations. Only rich institutions have the resources and staff to keep abreast of current research and to mount the technology necessary for its application. As the attention paid by government and corporations to scientific research has increased, the amount of time required to apply it has decreased. In the last century, fifty years elapsed between Faraday's demonstration that an electric current could be generated by moving a magnet near a piece of wire and Edison's construction of the first central power station. Only seven years passed between the realization that the atomic bomb was theoretically possible and its detonation over Hiroshima and Nagasaki. The transistor went from invention to sales in a mere three years. More recently, research on lasers was barely completed when engineers

began using it to design new weapons for the government and new long-distance transmission systems for the telephone company.

The result is that in many ways discovery and application, scientific research and engineering, can no longer be distinguished from each other. Our technological society has brought them so close together that today they can only be considered part of the same process. Consequently, while most scientific workers are motivated by humane considerations, or a detached pursuit of truth for truth's sake, their discoveries cannot be separated from applications which all too frequently destroy or debase human life.

Theoretical and experimental physicists, working on problems of esoteric intellectual interest, provided the knowledge that eventually was pulled together to make the H-bomb, while mathematicians, geophysicists, and metallurgists, wittingly or unwittingly, made the discoveries necessary to construct intercontinental ballistic missiles. Physicists doing basic work in optics and infrared spectroscopy may have been shocked to find that their research would help government and corporate engineers build detection and surveillance devices for use in Indochina. The basic research of molecular biologists, biochemists, cellular physiologists, neuropsychologists and physicians was necessary for CBW (chemical-biological warfare) agents, defoliants, herbicides, and gaseous crowd-control devices.

Anthropologists studying social systems of mountain tribes in Indochina were surprised when the CIA collected their information for use in counter-insurgency operations. Psychologists exploring the parameters of human intelligence for "purely scientific" reasons unintentionally created intelligence-testing instruments which, once developed, passed out of their hands and now help the draft boards conscript men for Vietnam and the U.S. Army allocate manpower more effectively. Further, these same intelligence-testing instruments are now an integral part of the public school tracking systems that, beginning at an early age, reduce opportunities of working-class children for higher education and social mobility.

Unfortunately, the problem of evaluating basic research does not end with such obscene misapplications as

these. One must also examine the economic consequences of basic research, consequences which flow from the structure of corporate capitalism under which we live. Scientific knowledge and products, like any other products and services in our society, are marketed for profit—that is, they are not equally distributed to, equally available to, or equally useable by all of the people. While they often contribute to the material standard of living of many people, they are



channeled through an organization and distribution of scarcity in such a way as to rationalize the overall system of economic exploitation and social control. Furthermore, they frequently become the prerogative of the middle and upper classes and often result in increasing the disadvantages of those sectors of the population that are already most oppressed.

For example, research in comparative and developmental psychology has shown that enriching the experience of infants and young children by increasing the variety and complexity of shapes, colors and patterns in their environment might increase their intelligence as it is conventionally defined. As these techniques become more standardized, manufacturers are beginning to market their

versions of them in the form of toys aimed at and priced for the upper and middle classes, and inaccessible to the poor. Research in plant genetics and agronomy resulted in the development of super strains of cereal crops which, it was hoped, would alleviate the problems of food production in underdeveloped countries. However, in many areas the expensive fertilizers required for growing these crops can be afforded only by rich farmers, and the "green revolution" has ended up by exacerbating class differences. Studies by sociologists and anthropologists of various Third World societies have been used by the U.S. government to help maintain in power ruling elites favorable to U.S. economic interests in those countries. The mapping studies of geologists, carried out in the interest of basic research, have been used by real-estate developers in California to lay out tract-housing developments that mean massive profits for the few and ecological catastrophe for the entire state.

On a larger scale, nearly all of the people and most organizations of people lack the financial resources to avail themselves of some of the most advanced technology that arises out of basic research. Computers, satellites, and advertising, to name only a few, all rely on the findings of basic research. These techniques are not owned by, utilized by, or operated for, the mass of the people, but instead function in the interests of the government and the large corporations. The people are not only deprived of the potential benefits of scientific research, but corporate capitalism is given new tools with which to extract profit from them. For example, the telephone company's utilization of the basic research on laser beams will enable it to create superior communication devices which, in turn, will contribute toward binding together and extending the American empire commercially, militarily, and culturally.

The thrust of all these examples, which could easily be elaborated and multiplied, is that the potentially beneficial achievements of scientific technology do not escape the political and economic context. Rather, they emerge as products which are systematically distributed in an inequitable way to become another means of further defining and producing the desired political or economic ends of those in power. New knowledge capable of application in ways

which would alleviate the many injustices of capitalism and imperialism is either not created in the first place or is made worthless by the limited resources of the victims.

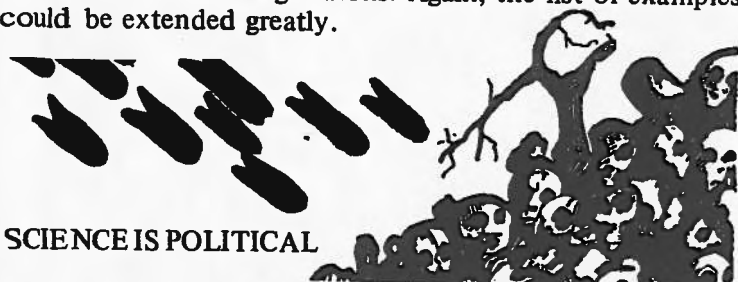
If we are to take seriously the observation that discovery and application are practically inseparable, it follows that basic researchers have more than a casual responsibility for the application of their work. The possible consequences of research in progress or planned for the future must be subjected to careful scrutiny. This is not always easy, as the following examples might indicate.

Basic research in meteorology and geophysics gives rise to the hope that man might one day be capable of exerting a high level of control over the weather. However, such techniques might be used to steer destructive typhoons or droughts into "enemy" countries like North Vietnam or China. As far back as 1960, the U.S. Navy published a paper on just this possibility and the need to develop the requisite techniques before the Russians did. (One has premonitions of future congressmen and presidential candidates warning us about the weather-control gap.) Rain-making techniques are already being used in Indochina, according to some reports, to induce cloudbursts over the Ho Chi Minh Trail.

Physicists working in the areas of optics and planetary orbits have provided knowledge which the American military was, and might still be, considering for the development of satellites in stationary orbit over Vietnam equipped with gigantic mirrors capable of reflecting the sun and illuminating large parts of the countryside at night. While scientific workers perform experiments on the verbal communication of dolphins, the Navy for years has been investigating the possibility of training them to carry torpedoes and underwater cameras strapped to their backs. Not surprisingly, much of the support for basic research on dolphins comes from the Office of Naval Research.

Neurophysiologists are developing a technique called Electric Brain Stimulation, in which microelectrodes capable of receiving radio signals are permanently implanted in areas of the brain known to control certain gross behaviours. Thus radio signals selectively transmitted to electrodes in various parts of the brain are capable of eliciting behaviors like rage or fear, or of stimulating appetites for food or sex. The

possibility of implanting these electrodes in the brains of mental patients or prisoners (or even welfare recipients or professional soldiers) should not be underestimated, especially since such uses might be proposed for the most humane and ennobling reasons. Again, the list of examples could be extended greatly.



SCIENCE IS POLITICAL

An analysis of scientific research merely begins with a description of how it is misapplied and maldistributed. The next step must be an unequivocal statement that scientific activity in a technological society is not, and cannot be, politically neutral or value-free. Some people, particularly after Hiroshima and Nuremberg, have accepted this. Others still argue that science should be an unbridled search for truth, not subject to a political or a moral critique. J. Robert Oppenheimer, the man in charge of the Los Alamos project which built and tested the first atomic bombs, said in 1967 that, "our work has changed the conditions in which men live, but the use made of these changes is the problem of governments, not of scientists."

The attitude of Oppenheimer and others, justified by the slogan of truth for truth's sake, is fostered in our society and has prevailed. It is tolerated by those who control power in this country because it furthers their aims and does not challenge their uses of science. This attitude was advanced centuries ago by people who assumed that an increase in available knowledge would automatically lead to a better world. But this was at a time when the results of scientific knowledge could not easily be anticipated. Today, in a modern technological society, this analysis becomes a rationalization for the maintenance of repressive or destructive institutions, put forth by people who at best are motivated by a desire for the intellectual pleasure of research, and often are merely after money, status, and soft jobs. We believe it would be lame indeed to continue to argue that

the possible unforeseen benefits which may arise from scientific research in our society will inevitably outweigh the clearly foreseeable harm. The slogan of "truth for truth's sake" is defunct, simply because science is no longer, and can never again be, the private affair of scientists.

Many scientists, even after considering the above analysis, may still feel that no oppressive or exploitative technology will result from their particular research. Two arguments are relevant here. First, even research without foreseeable practical application serves to advance the field generally, and to provide a more sophisticated background from which technology may be derived. The Department of Defense recognizes this and annually invests millions of dollars in such "impractical" research, knowing that in the long run it pays off. The preferential funding of certain areas of basic research makes it more likely that those areas and not others will advance to the point where the emergence of this technology becomes more probable. Second, while formerly scientific activity consumed only an infinitesimal amount of society's resources, the situation has changed drastically in the last 25 years. Scientific activity now commands a significant amount of social resources, resources which are in short supply and are necessary to meet the real needs of the majority of the people. The point here is not that scientific activity should cease, but rather that it should truly be a science for the people.

Some scientists have recognized this situation and are now participating in nationally coordinated attempts to solve pressing social problems within the existing political-economic system. However, because their work is usually funded and ultimately controlled by the same forces that control basic research, it is questionable what they can accomplish. For example, sociologists hoping to alleviate some of the oppression of ghetto life have worked with urban renewal programs only to find the ultimate priorities of such programs are controlled by the city political machines and local real estate and business interests rather than by the needs of the people directly affected by such programs. Psychologists, demographers, economists, etc., worked on a Master Plan for Higher Education for New York City that would guarantee higher education for all. In practice open enrollment was restricted to the lowest level which

channelled students into menial jobs set by corporate priorities while the main colleges remained virtually as closed as before.

Behavioral and clinical psychologists have tried to develop procedures for applying conditioning techniques to human psychopathology. Their work is now used in state hospital programs which, under the guise of "therapy," torture homosexual people with negative reinforcement, usually electrical, in order to convert them forcefully to heterosexuality. (There are still 33 states in which homosexuals may be "committed" under archaic sexual psychopath laws for *indefinite* sentences). No one is impugning the motives of Pavlov or Skinner, but this is what it has come to in the United States. Thus the liberal panacea of pouring funds into social science research to create Oak Ridge-type institutions for the social sciences is no more likely to improve the quality of life than the namesake institution has. The social sciences are not performed in a political vacuum any more than the natural sciences are. They all ultimately serve the same masters.

Even medical research is not without negative social impact. The discovery of a specific disease cure or preventive measure invariably depends upon prior basic research which is frequently linked to non-medical misapplications, often before it is used to produce disease cures. For example, the work of microbiologists who are decoding the DNA molecule gives hope for the genetic control of a wide variety of birth defects. Already this research has been used by government and military technicians to breed strains of virulent microbes for germ warfare. Further, it is not unreasonable to expect that someday this research will lead to genetic engineering capable of producing various human subpopulations for the use of those who are in technological control. These might include especially aggressive soldiers for a professional army, strong drones to perform unpleasant physical labor, or "philosopher kings" to inherit control from those already possessing it.

Applied medical research, as well as the more basic variety typified by DNA work, is no less free of the possibility of mis-application. More than purely humane consequences could emerge from one of the latest dramatic medical

advances, organ transplantation. Christiaan Barnard has publicly urged that people be educated to "donate" their organs. It is not overly visionary to imagine that society's underclass, whose labor is decreasingly in demand, might be nourished as a collective "organ bank." If this occurred, it would most probably be on a *de facto* rather than *de jure* basis, as is the case with other forms of class and racial oppression. That is, monetary and other incentives would be instituted to encourage "volunteers" so that direct coercion would be unnecessary. Models for the poor selling parts of their bodies already exist in the form of wet nurses, indigent professional blood donors, and convicts and colonial peoples serving as subjects for experiments. An example of the last was the use of Puerto Rican women to test birth control pills before they were considered safe to market in the United States (and now evidence that had been suppressed by the drug companies, the government, and the medical profession indicates that they are not safe after all—see J. Coburn in *Ramparts*, June, 1970.).

The misapplication of medical or premedical knowledge is, however, only half of the problem. The tragically overcrowded and understaffed city and county hospitals of our large metropolitan areas testify to the inequities and class biases in the distribution of medical knowledge as well. People here and throughout the world needlessly suffer and die because the money to pay for, the education with which to understand, or the physical proximity to, modern medicine has been denied them. By virtue of this, much of medical research has taken place for exclusive or primary use by the affluent.

Some medical discoveries have been equitably and, at least in our society, almost universally distributed. The Salk and Sabin vaccines are one example. Yet one is forced to wonder if this would have occurred had polio been less contagious. If the people who are in charge of our public health services could have protected their own children without totally eradicating polio, would they have moved as fast and as effectively? Witness their *ability* to prevent or reverse effects of malnutrition, while thousands of children within our borders alone suffer from it. In fact, while polio vaccines may have been an exception, the gravest problem we face in terms of disease is not discovering new cures or

preventive measures. Rather it is discovering ways of equitably distributing the medical knowledge we already possess, and that, ultimately, is a political problem.

WHAT IS TO BE DONE?

In this society, at this time, it is not possible to escape the political implications of scientific work. The American ruling-class has long had a commitment to science, not merely limited to short-range practical applications, but based on the belief that science is good for the long-term welfare of American capitalism, and that what is good for American capitalism is good for humanity. This outlook is shared by the trustees of universities, the official leaders of U.S. science, the administrators of government and private funding agencies. Further, they see this viewpoint as representing a mature social responsibility, morally superior to the "pure search for truth" attitudes of some of the scientists. But they tolerate that ideology since it furthers their own aims and does not challenge their uses of science.



Palante/LNS

We find the alternatives of "science for science's sake" and "science for progress of capitalism" equally unacceptable. We can no longer identify the cause of humanity with that of U.S. capitalism. We don't have two governments, one which beneficently funds research and another which represses and kills in the ghettos in Latin America, and in Indochina. Nor do we have two corporate structures, manipulating for profit on the one hand while desiring social equity and justice on the other. Rather there is

a single government-corporate axis which supports research with the intention of acquiring powerful tools, both of the hard- and soft-ware varieties, for the pursuit of exploitative and imperial goals.

Recognizing the political implications of their work, some scientists in recent years have sought to organize, as scientists, to oppose the more noxious or potentially catastrophic schemes of the government, such as atmospheric nuclear testing, chemical and biological warfare development, and the antiballistic missile system. Others shifted fields to find less "controversial" disciplines: Leo Szilard, who had been wartime co-director of the University of Chicago experiments which led to the first self-sustaining chain reaction, quit physics in disillusionment over the manner in which the government had used his work, and devoted the rest of his life to research in molecular biology and public affairs. In subsequent years other physicists followed Szilard's lead into biology, including Donald Glaser, the 1960 recipient of the Nobel Prize. Yet in 1969, James Shapiro, one of the group of microbiologists who first isolated a pure gene, announced that for political reasons he was going to stop doing *any* research. Shapiro's decision points up the inadequacy of Szilard's, but is no less inadequate itself.

Traditional attempts to reform scientific activity, to disentangle it from its more malevolent and vicious applications, have failed. Actions designed to preserve the moral integrity of individuals without addressing themselves to the political and economic system which is at the root of the problem have been ineffective. The ruling class can always replace a Leo Szilard with an Edward Teller. What is needed now is not liberal reform or withdrawal, but a radical attack, a strategy of opposition. Scientific workers must develop ways to put their skills at the service of the people and against the oppressors.

POLITICAL ORGANIZING IN THE HEALTH FIELDS

How to do this is perhaps best exemplified in the area of health care. It is not by accident that the groups most seriously dealing with the problem of people's health needs are political organizations. A few years ago the Black Panther

Party initiated a series of free health clinics to provide sorely needed medical services that should be, but are not, available to the poor, and the idea was picked up by other community groups, such as the Young Lords, an organization of revolutionary Latinos and Puerto Ricans. Health and scientific workers, organized by political groups like the Medical Committee for Human Rights and the Student Health Organization, have helped provide the necessary professional support, and in the past few years literally hundreds of free people's health centers have sprung up across the country.

Health workers, organized into political groups, can provide more than just diagnosis and treatment. They can begin to re-define some medical problems as social problems, and through medical education begin to loosen the dependence of people on the medical profession. They can provide basic biological information, demystify medical sciences, and help give people more control over their own bodies. For example, in New York, health workers provided a simple way of detecting lead poisoning to the Young Lords Organization. This enabled the Young Lords to serve their people directly through a door-to-door testing campaign in the Barrio, and also to organize them against the landlords who refused to cover lead-painted walls, often with the tacit complicity of the city housing officials.



It is this kind of scientific practice that most clearly characterizes Science for the People. It serves the oppressed and impoverished classes and strengthens their ability to struggle. The development of People's Science must be marked by these and other characteristics. For example, any

discoveries or new techniques should be such that all people have reasonably easy access to them, both physically and financially. This would also militate against their use as a means of generating individual or corporate profit. Scientific developments, whether in the natural or social sciences, that could conceivably be employed as weapons against the people must be carefully evaluated *before* the work is carried out. Such decisions will always be difficult. They demand a consideration of factors like the relative accessibility of these developments to each side, the relative ease and certainty of use, which will of course depend on the demand, the extent to which the power balance in a specific situation could be shifted and at what risk, and so forth. Finally, scientific or technological programs which claim to meet the needs of the people, but which in fact strengthen the existing political system and defuse their ability to struggle, are the opposite of People's Science.

There is a wide range of activities that might constitute a Science for the People. This work can be described as falling into six broad areas:

1. Technical assistance to movement organizations and oppressed people.

The free people's health centers have already been described as an example of this approach. Another example would be designing environmental poisoning detection kits for groups trying to protect themselves from pollution and trying to organize opposition to the capitalist system which hampers effective solutions to pollution problems. The lead poisoning test was such an effort, and other kinds of pollution are equally amenable to this approach. These kits would have to be simple to operate, easy to construct, and made from readily available and cheap materials.

Research to aid student and community struggles for free, decent higher education is being conducted by the New University Conference and other groups. Of interest are answers to questions involving the economy of higher education, such as what classes pay what share of the tax bill, how are educational resources apportioned among the economic classes, how is higher education differentially defined in different types of schools, how does

discrimination operate against women and Third World people in education, what role do corporations play in setting up program priorities, especially in the working-class junior colleges. Research also needs to be done on the possibilities for open enrollment in various school systems and on the test instruments and the tracking system which channel students and distribute educational privilege on the basis of social class.

Research could be performed which would assist rank-and-file groups now attempting to organize politically in the factories. Useful information might include the correlation between industrial accident rates and the class, race, and sex of the work force, the mechanics of the unemployment compensation and accident compensation programs which more often make profits for insurance companies than help workers, the nature of union-management contracts, how they have served to undermine workers' demands and how they might be made more effective, and so on. All of these projects would be examples of Science for the People as technical assistance.

2. Foreign technical help to revolutionary movements.

American scientific workers can provide material aid to assist struggles in other countries against U.S. or other forms of imperialism, or against domestic fascism. For example, the Popular Liberation Movement of Angola, fighting against Portuguese domination, has requested help in setting up medical training facilities. These are sorely needed in those areas of Angola that have been liberated and are undergoing social and economic reconstruction.

Similarly, Americans can aid revolutionary regimes abroad. The effects of the U.S. blockade of Cuba could be reduced by North American scientific workers going there to do research or to teach, as some have already done. Or, they could do research here on problems of importance for development in Cuba, such as on sugar cane and rice production, tropical pest control, and livestock breeding. At a minimum, U.S. scientists should be encouraged to establish regular contact and exchange reprints and other information with their Cuban counterparts.

Another example of this kind of foreign technical assistance is a Science for Vietnam project, involving collaboration between Americans and scientists from the Democratic Republic of Vietnam and the Provisional Revolutionary Government of South Vietnam on such problems as locating plastic pellets in human flesh (several years ago the U.S. Air Force increased the terrorizing effect of anti-personnel bombs by switching from metal fragmentation devices to plastic pellets, which do not show up on x-rays), reforestation techniques, how to decontaminate herbicide-saturated soils, and many other problems now facing the Vietnamese as a result of the U.S. intervention there.

This kind of foreign technical assistance has important political significance in addition to its material consequences, for it is the most direct way one can oppose the imperialist policies of the U.S. government, undermine its legitimacy, and go over to the side of the oppressed people of the world. If an important sector of the population, like scientific workers, begins to act in this way, it may encourage similar action by workers in other areas.



3. People's research.

Unlike the technical assistance projects described above, which are directly tied in with on-going struggles, there are areas in which scientists should take the initiative and begin developing projects that will aid struggles that are just beginning to develop. For example, workers in the medical and social sciences and in education could help design a program for client-controlled day care centers which would both free women from the necessity of continual child care and provide a thoroughly socialist educational

experience for the children. As such, it would be useless to those who are trying to co-opt the day care struggle into an extension of social control or as a means of making profits.

For use in liberation struggles, self-defense techniques could be developed that would be readily available to the people, and useless to their highly technological opposition. Biologists and chemists, for example, could develop an all-purpose gas mask for which the necessary materials are simple, easy to assemble, readily available, and inexpensive.

Physiologists and others could perform definitive research in nutrition and disseminate their findings so that poor and working-class people would have information on how to get the most nourishing diet for the least cost. Furthermore, such research could aid them in avoiding the possibly dangerous food additives and contaminants that are now found in most packaged foods.

As a minimal effort, medical researchers could begin to concentrate their work on the health needs of the poor. The causes of the higher infant mortality rates and lower life expectancy of a large part of the working class, particularly non-whites, should get much more research attention. Occasionally funds are available for this kind of research but the class background and biases of many researchers often predispose them toward work on other problems. In addition, new ways of distributing and utilizing medical knowledge, especially with respect to prevention, must be designed.

4. Exposés and power structure research.

Most of the important political, military and economic decisions in this country are made behind closed doors, outside the public arena. Questions about how U.S. corporations dominate foreign economic markets and governments, how corporate conglomerates control domestic markets and policy-making, how party machines run city governments, how universities and foundations interlock with military and various social control strategies, how the class struggle in the U.S. is blunted and obscured, etc., must be researched and the conclusions published to inform all the people.

Exemplary work of this kind has already been performed by research collectives like the North American Congress on Latin America (NACLA), the National Action Research on the Military Industrial Complex (NARMIC), the Africa Research Group, and others. These groups have provided valuable information for community and campus groups in campaigns such as those against university collaboration with the Indochina War and exploitation in various Third World countries, against anti-personnel weapons manufacturers (like Minneapolis Honeywell), and against specific corporations involved in particularly noxious forms of oppression (like Polaroid's large investments in South Africa and their current contract to provide the government there with photo-ID cards for all citizens which will help that government to implement more effectively its racist apartheid policy).

5. Ideological struggle.

Ruling-class ideology is effectively disseminated by educational institutions and the mass media, resulting in misinformation that clouds people's understanding of their own oppression and limits their ability to resist it. This ruling-class ideology must be exposed as the self-serving manipulation that it is. There are many areas where this needs to be accomplished. Arguments of biological determinism are used to keep blacks and other Third World people in lower educational tracks, and these racist arguments have recently been bolstered by Jensen's focusing on supposed racial differences in intelligence. Virtually every school of psychopathology and psychotherapy defines homosexuals as sick or "maladjusted" (to a presumably "sane" society). These definitions are used to excuse this society's discriminatory laws and practices with respect to its large homosexual population and have only recently been actively opposed by the Gay Liberation Movement. Similarly, many psychotherapists and social scientists use some parts of Freudian doctrine to justify sexist treatment of women.

The elitist biases of most American social scientists oppress students from working-class and poor backgrounds, as well as women and non-whites, by failing to adequately portray their history and culture. Instead, bourgeois culture

and ruling-class history are emphasized as if they were the only reality. This laying on of culture is particularly heavy-handed in community and working-class colleges (for an elaboration of this point, see J. McDermott, *Nation*, March 10, 1969). To combat this, social scientists should work to make available to the people their true history and cultural achievements.

This kind of Science of the People as ideological struggle can be engaged in at several levels, from the professional societies and journals to the public arena, but for it to be most effective it should reach the people whose lives it is most relevant to, and who will use it. Those in teaching positions especially have an excellent opportunity to do this. For example, courses in any of the biological sciences should deal with the political reasons why our society is committing ecological murder/suicide. Courses in psychopathology should spend at least as much time on our government officials and our insanely competitive economic system as they do on the tortured victims incarcerated in our mental "hospitals," many of whom would not be there in the first place if they lived in a society where normality and sanity were synonymous. Within these and many other disciplines, individual instructors can prepare reading lists and syllabi to assist themselves and others who are interested in teaching such courses but lack the background or initiative to do the work themselves.

6. *Demystification of science and technology.*

No one would deny that science and technology have become major influences in the shaping of people's lives. Yet most people lack the information necessary to understand how they are affected by technological manipulation and control. As a result they are physically and intellectually incapable of performing many operations that they are dependent upon, and control over these operations has been relinquished to various experts. Furthermore, these same people undergo an incapacitating emotional change which results in the feeling that everything is too complicated to cope with (whether technological or not), and that only the various experts should participate in decision making which often directly affects their own lives. Clearly, these two

factors are mutually enhancing.

In the interests of democracy and people's control, the false mystery surrounding science and technology must be removed and the hold of experts on decision making must be destroyed. Understandable information can be made available to all those for whom it is pertinent. For example, the Women's Liberation Movement has taken the lead in teaching the facts about human reproductive biology to the people who need it the most for control over their own bodies. An example of this is a group of women in the Chicago Women's Liberation Union who have written a series of pamphlets on pregnancy and childbirth, giving complete medical information in language everyone can understand. Free schools and movement publications teach courses and run articles on medical and legal first-aid, self-defense, effective nutrition, building houses, repairing cars and other necessary appliances, and so on. Much more of this kind of work needs to be done. In addition, the relevant scientific information on issues that have important political repercussions, such as radiation poisoning and pesticide tolerance, should be made available to the public.

Part of the job of demystification will have to take place internally, within the scientific community. Scientific workers themselves must expose and counter the elitist, technocratic biases that permeate the scientific and academic establishments. One vehicle for doing this has been the publication by a collective of scientific workers of a bimonthly magazine, called *Science for the People* (9 Walden Street, Jamaica Plain, Mass. 02130). Attempts to demystify science must take place at many levels. The doctrine that problems of technology can be met with technological rather than political solutions is increasingly being incorporated into the ruling ideology. The counter argument should be made that only political re-organization will be effective in the long run, and this argument will need to be bolstered by more research. On the level of daily practice, elitist tendencies can be undermined in laboratories and classrooms by insisting that *all* workers or students participate in decision-making that affects what they do and by creating conditions that insure them the information necessary to make those decisions. The elitism and top-down authority

structuring of most scientific meetings and conventions can be opposed by members forcefully insisting that they be given some control over the selection of speakers and that all scheduled speakers address themselves to the political implications of their work. This is already happening with increasing frequency as radical caucuses begin to form in many of the professional associations.

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The practice of Science of the People is long overdue. If scientific workers and students want to overcome the often alienating nature of their own work, their impotence in bringing about meaningful social change, their own oppression and that of most of the other people in the world, they will have to relinquish their uncritical devotion to the pursuit of new knowledge. Scientific workers must re-organize scientific work, not in terms of the traditionally defined disciplines, but according to the real problems they consciously set out to solve. The old breakdown into separate disciplines, which produces "experts" who can barely communicate with each other, must give way to new structures which allow more cooperation and flexibility, and which will undoubtedly demand the acquisition of new skills. Such work can be as intellectually stimulating as the work we do now, with the added satisfaction that it is meeting real needs of people.

If projects like those described above are to constitute a real Science for the People, they must achieve more than their immediate technical goals. They should relate to issues around which people can organize to act in their own self-interest. Research projects should both flow out of the needs and demands of the people, and be relevant to their political struggles. This requires consulting with and relying on the experience of community and movement groups, and taking seriously the criticisms and suggestions that they put forth. Scientists must succeed in re-directing their professional activities away from services to the forces and institutions they oppose and toward a movement they wish to build. Short of this, no matter how much they desire to contribute to the solution, they remain part of the problem.

Censorship by Science

The preceding article, "Towards a Science for the People," was censored out of the pages of *Science*, not a few paragraphs or a blue-pencilled phrase here and there, but the entire article. The journal's editor, Philip Abelson, performed the surgery single-handed, against the advice of colleagues and in violation of precedent in effect for decades. How did this happen? And what does it mean?

WHAT?

Science is a weekly periodical published by the American Association for the Advancement of Science (AAAS). With a circulation of close to 164,000, it is probably the single most important interdisciplinary scientific journal in the United States today. The 100+ pages of *Science* carry analyses of science and society, editorials, letters, and highly technical reports from all branches of scientific work.

The stated objectives of the AAAS are "to further the work of scientists, to facilitate cooperation among them, to improve the effectiveness of science in the promotion of human welfare, and to increase public understanding and appreciation of the importance and promise of the methods of science in human progress." The fact that the editor of *Science* chose total censorship for the article means that a growing perspective among scientists of "science in the promotion of human welfare" has been suppressed from presentation to a significant sector of the scientific community without their knowledge or consent, thus preventing others from even reading an important and controversial view of the role that science plays in the United States today, and of what that role ought to be.

HOW?

The censorship story begins at the 1970 meetings of the American Association for the Advancement of Science, held in Chicago. Science for the People members distributed a ten-page mimeographed paper there describing the political and economic impact of scientific work in North America and trying to outline a program for integrating science and social change. In spite of the existence and free distribution of several thousand copies of the paper, the Science for the People group at the AAAS meeting was criticized for not issuing a detailed and public statement of its analysis and objectives. These criticisms not only ignored the paper, but also the bi-monthly publication, *Science for the People*, which were available throughout the meetings.

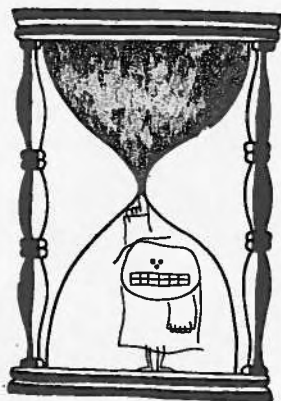
In any case, several individuals decided to expand the original paper and submit it to *Science* for publication. This was done in February, 1971. Shortly thereafter the expanded version was rejected and returned with criticisms rather unusual for a scientific journal. Disregarding editorial comments that questioned the authors' integrity, intelligence, even sanity, they decided to drastically revise the paper once again in a final attempt to communicate with the massive readership of *Science*.

The outcome of that revision, the version in this pamphlet, was sent to *Science* in June. In accordance with the customary procedure, the article was submitted to three referees chosen by the editor, Philip Abelson. The referees unanimously, unambiguously, and enthusiastically advised Abelson in favor of publication. They gave various reasons. Among them:

...[The article] is an important position in the debate over the objectives and public responsibilities of science which *Science* magazine has been encouraging for several years, with many major articles supporting opposite points of view....If it is not published in *Science*, it would mean that *Science* is not representing the full spectrum of opinion in the scientific community, and would drive this whole segment of opinion to other media or "underground"....

This paper is interesting and well-written....[It] is a statement that frankly takes sides; yet in an area in which other points of view are well represented, and most readers are likely to be meeting the attitudes presented here for the first time...

...This paper is extremely welcome and perhaps even overdue. It should be given top priority for publication. It represents a serious attempt to explain in detail the analysis and some of the proposed directions of this [Science for the People] movement. The readers I think will be somewhat surprised that the authors deal with real change and program rather than disruption and confrontation. The pages of *Science* have been used for discussion of the relation between science and politics in the past so there should be no hesitation with regard to the relevance of politics in the magazine....*



However, Abelson felt that a 3-0 unequivocal recommendation for publication by the referees was not conclusive enough. So he took the unusual step of sending the article off to four more referees; each of whom was on the editorial board of the magazine. But Abelson's disappointments were not yet over.

Two of the four hand-picked extra referees broke ranks and advised in favor of publication. Their reasons, however,

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*All the quotes are from photocopies of the referees' reviews sent to the authors by a friend on the staff of *Science*.

were less favorable than those of the original three referees.
For example:

This is an idiotic paper which should be published. This position is taken by crackpot radicals who, unfortunately, make up a significant part of our students and junior faculty these days. These authors present the crackpot radical view of science conscientiously and effectively. I think it should be published as part of the documents of our era; because we are liberal and make room for all views....

The other two, who favored rejection, argued as follows:

...Anything I say, and anything that anyone I regard as perceptive will say, is bound to be unsatisfactory to the authors, who, in regarding the inward voice and the inward vision, catch only pale and fleeting glimpses of what lies outside of themselves. I think you'll have to turn the paper down cold. Doctrinaire fanatics are not open to argument or conviction.

...this paper is not a scholarly work nor a thoughtful exposition of ethics. It is rather low quality propaganda.

At this point the beleaguered editor, Abelson, had obtained a 5-2 recommendation in favor of publication. He apparently gave up on the tactic of recruiting additional referees, and instead decided on the more reliable approach of simply invoking his editorial power to reject the article, regardless of the referees' opinions. And as far as *Science* is concerned, that is where the matter still stands in December of 1972.

—Pat Griffin, George Salzman, Bill Zimmerman

-----from the original Censored pamphlet

We do not intend to allow the powerful within the scientific establishment to prevent us from communicating with our fellow scientific workers. Here then is our article, published in pamphlet form....we urge you to consider the meaning of freedom of speech when those whose ideas are threatening are denied access to the press and other means of communication. Those who insist upon being heard in spite of such denials are often the ones wrongly accused of violating that principle.

It has been our experience that speech cannot be free in an environment of exploitive profit and concentration of power. Freedom of speech, reasonable access to the avenues of communication, are limited. The limits are the rules of the established game, the set of prior assumptions one must accept in order to win the "freedom" to move around within the limits. One of the rules is that political change must occur in an orderly fashion, orderly enough for the powerful to retain, or even extend, their power while appearing to relinquish a portion of it. Try and advocate the kind of political change that would really undermine the powerful--your liberal freedoms will disappear into thin air and you will find yourself standing under an umbrella of ordinary repression.

The lesson of Vietnam has been learned by the functionaries and managers of the United States, by people like Philip Abelson: if you cannot effectively deal with an opponent through persuasion or compromise, use force. But there are other lessons of Vietnam.

B.Z.

ABOUT SCIENCE FOR THE PEOPLE

Science for the People is the popular name of **Scientists and Engineers for Social and Political Action (SESPA)**. **Science for the People** is the name of the magazine which grew out of the original **SESPA** newsletter, and which, since its inception in August, 1970, has been published by Boston-area members.

Science for the People is made up of secretaries and scientists, technicians and teachers—all those who do and are affected by science and technology. We are organized as local chapters and come together for national actions at scientific gatherings. The variation of opinions within **Science for the People** is reflected in the diversity of our activities: exposing and confronting militaristic and social control research, providing technical assistance to movement, labor, and Third World groups, developing alternative science curricula, and organizing technical workers within established institutions. However, we share a basic agreement that science in our society is used for control and profit; to benefit the few not the many.

One of the most prominent activities is publication of **Science for the People**, a bi-monthly periodical containing articles on the relationship of science to political and social issues, reports of the activities at national meetings of traditional scientific organizations such as the **American Association for the Advancement of Science** and the **National Science Teachers' Association**, letters from readers, and, importantly, reports of the activities of the various **Science for the People** groups around the country and abroad. The editorial collectives change with each issue.

If you would like to know more about **Science for the People**—to join in its activities—to subscribe to the magazine, use the form on the back of this page. You can remove it without damaging the pamphlet.