

SCIENCE FOR THE PEOPLE

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TECHNOLOGY
AND
DEVELOPMENT
FOR
WHOM?

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EDITORIAL COLLECTIVE: Adriano Giannola, Kathy McMahon, Joan Mercier, Bob Park, David Westman

CONTRIBUTORS: Gar Allen, Rita Arditti, Patricia Browne, Fidel Castro, James Cockroft, Sheila Cutler, Britta Fischer, Carol Hinchey, Jeanne Olivier, Vinton Thompson, Sarah Vinal, Daniel Zuck, Berkeley SESPA, AAAS/Mexico City Project, Puerto Rican Socialist Party

PICTURE CREDITS:

Cover: *This Great People has said: "Enough!" and has begun to move . . .*

p. 15: *Claridad*

p. 24: *Ramparts*

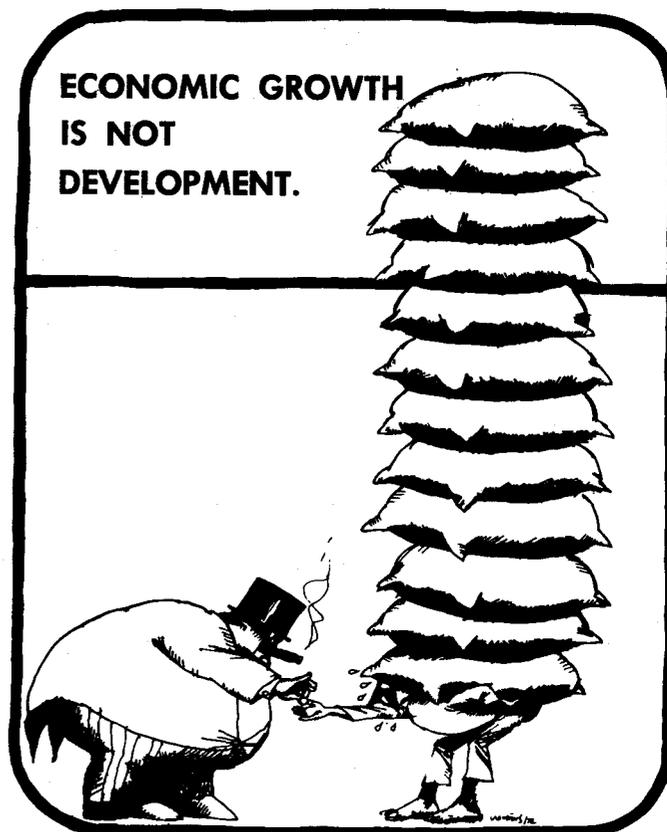
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EDITORIAL PRACTICE

Each issue of *Science for the People* is prepared by a collective, assembled from volunteers by a committee made up of the collectives of the past calendar year. A collective carries out all editorial, production, and distribution functions for one issue. The following is a distillation of the actual practice of the past collectives. **Due dates:** Articles received by the first week of an odd-numbered month can generally be considered for the magazine to be issued on the 15th of the next month. **Form:** One of the ways you can help is to submit double-spaced typewritten manuscripts with ample margins. If you can send six copies, that helps even more. One of the few founding principles of *SESPA* is that articles must be signed (a pseudonym is acceptable). **Criteria for acceptance:** *SESPA Newsletter*, predecessor to *Science for the People*, was pledged to print everything submitted. It is no longer feasible to continue this policy, although the practice thus far has been to print all articles descriptive of *SESPA/Science for the People* activities. Considerably more discrimination is applied to analytical articles. These are expected to reflect the general political outlook of *Science for the People*. All articles are judged on the basis of length, style, subject and content. **Editorial Procedure:** The content of each issue is determined by unanimous consent of the collective. Where extensive rewriting of an article is required, the preference of the collective is to discuss the changes with the author. If this is not practical, reasons for rejection are sent to the author. An attempt is made to convey suggestions for improvement. If an article is late or excluded for lack of space, or if it has non-unanimous support, it is generally passed on to the next collective. **Editorial statements:** Unsigned articles are statements of the editorial collective. **Opportunities for participation:** Volunteers for editorial collectives should be aware that each issue requires a substantial contribution of time and energy for an eight-week period. Help is always appreciated and provides an opportunity for the helper to learn, and for the collective to get to know a prospective member. There are presently plans to move the magazine production to other cities. This will increase the opportunity for participation. For legal purposes *Science for the People* has become incorporated.

About this issue and others

The overall direction for each issue of the magazine is provided by the "Bagholders", members of the editorial collectives for one year past. The Bagholders also organize new editorial collectives. For this issue with an eye to the meeting of the American Association for the Advancement of Science (AAAS), June 20 - July 4 in Mexico City, the Bagholders chose the theme "technology and imperialism". What follows are some reflections on the particular relevance of this focus today.

There are inspiring lessons in the Watergate phenomenon: one is, how fragile the legitimacy of Power is in America, such that when the sacred "electoral process" is briefly compromised in appearance, there is a flurry of cleansing behavior on the part of all concerned institutions, including both parties. Then, there is the widespread and intense interest in the unfolding of this "crime". Of course, there has always been appropriate cynicism about politicians, but one gets the impression that, if the daily routine crimes of the power holders were given similar, detailed exposure, there would soon be a popular basis for some dramatic change in America. By "routine crimes" we mean for example the continuing U.S. occupation and decimation of S.E. Asia, the massive cut-backs in health and welfare programs of all kinds, the continuing sexism and racism in all major institutions, a programmed inflation/squeeze, and the general misdesign of priorities. All of these, affecting most people, are routinely handled as calculated moves in the service of Business, friends, and the rich in general, with at best some grumbling from some Congressmen.

Therefore, we are proposing that the process of development and the particular role of technology are another area of concealed crime. In this issue we examine how technology and imperialism go hand in hand in the service of U.S. corporate developers. (The same points can also be made about corporate developers from other industrialized countries.) Contemporary science and ideology argue that the development process is in great need of technological innovation and refinement, supplied by the "advanced" countries. In seeking to propagate this claim, organizations such as the AAAS argue as though technological advancement and development are neutral processes, and they take the view that "more" is synonymous with "progress". We will try to show how false this notion is; that the consequences of "development" depend on who the developers are, that technology and class ideology are considerably interwoven, and that development under global capitalism is really *misdevelopment*.* Our view is that we must change the social structure

to create a new role for science and technology that serves all the people without exploitation.

The article on patents and technological dependence examines some of the legal relations between technology and imperialism. The conception of technology as private property means that the direction of that technology is determined by the international corporations which hold the patents. The article on environmental colonialism describes some of the consequences, in this case for the people of Puerto Rico, of submission to the capitalist notion of "development". The analysis of the AAAS meeting in Mexico City provides a picture of the role such societies play in this process. It has been rumored that the AAAS chose Mexico City to counter flagging member interest in the usual fare of AAAS annual meetings. However, as this article shows, there are other more important reasons for such a meeting.

Castro's speech and the article on agriculture in China (excerpts from a draft chapter of a book to be published soon, written by SESPAs people who recently visited China) relate, in contrast, a different picture of development — one of self-sufficiency, with participation, control, and support of the people. While there is some disagreement about how far China and Cuba have actually departed from the traditional capitalist mode of development, many of their achievements are nevertheless stunning contrasts to the rest of the "developing" or "developed" world.

The articles on motivation ideology and women's biology relate to "science" itself as a tool of imperialism. Technology is not always in the form of machines; sometimes it can take the form of ideologies developed to justify the exploitation of the many by the few. Such systems of manipulative ideologies become especially insidious because in this case we are all colonized by our oppressors; the system, in the form of its justifications, resides within us in much the same way as a colonizer inhabits the colonized country.

*It is interesting to note that the leading theoreticians in post-1917 Soviet Russia did not distinguish between technology and capitalist ideology, which is perhaps not unrelated to the ultimate results.

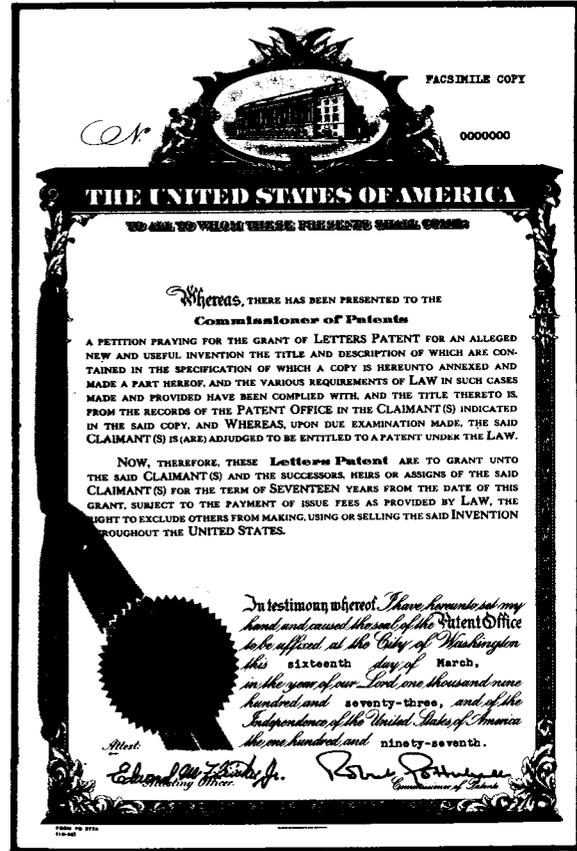
FUTURE ISSUES

An effort is being made to plan the focus of *SftP* issues sufficiently in advance to encourage discussion and the writing of articles. Some of the topics which are being considered include the following: THE ENERGY CRISIS, looking into many aspects; THE EXPLOITATION OF STUDENTS, in a variety of educational contexts; POLITICAL STRATEGY FOR PROFESSIONAL MEETINGS, including review of past activities of different organizations and plans for the future. Anyone interested in contributing is encouraged to contact *SftP* so that there can be coordination of plans, circulation of drafts etc., and thus a better magazine.

Technological Dependence

PATENTS AND TRANSNATIONAL CORPORATIONS

WITH SPECIAL EMPHASIS ON CHILE



abridged from a chapter in Dale L. Johnson, ed., *The Chilean Road to Socialism (Spanish Edition)*, Mexico City: *Fonda de Cultura Económica*, 1973.

*Who pays royalties to Cervantes and Shakespeare?
Who pays the inventor of the alphabet, who pays
the inventor of numbers, arithmetic, mathematics?
In one way or another all of mankind has benefited
from, and made use of those creations of the intellect
that man has forged through history . . .
We state that we consider all technical knowledge
the heritage of all mankind and especially of those
peoples that have been exploited.*

*Fidel Castro
29 April 1967*

The purpose of this analysis is to explore the relationship which the less developed countries (LDC) have with the United States, Europe, and Japan concerning technological dependence. This dependence, engendered by the patent system along with the sale and distribution of technology by transnational corporations, further contributes to the drain of capital—already scarce—from these countries. Special attention is given to Chile because that nation's policies of economic nationalism represent a po-

tentially critical challenge to the forces of technological dependence.

Outright stock ownership is the usual means of economic plunder by transnational corporations. However in the less developed countries where conditions of economic nationalism prevail, majority ownership can become secondary in importance. This is because nationalization of strategic industries can succeed only if dependence on foreign technology is eliminated, since this dependence allows continued foreign control over decision-making and profit. Thus, under conditions of assertive nationalism, the older methods of exploitation—via ownership—tend to be replaced with newer ones more suitable to the moment.

In describing technological dependence, we directed our attention to patents, social class, and the culture of technology, because of their primacy in today's imperialism. If an LDC is to escape perpetual technological dependence, it must combat the ruling elite which bases its power and life style on links to foreign technology, and also deal with the underlying value system which accompanies the importation of foreign technology (including middle-class concepts of affluence and the myth of technological expertise).

An important factor in creating or perpetuating dependence is the comparative cost of technology. Most LDC's find that developing original or alternate sources of technology costs more than purchasing the already existing technology as sold by large transnational corporations.[1]

While economic nationalism may modify certain aspects of dependence, underdeveloped economies which suffer from a relative shortage of investment and human capital tend to be run on the basis of short or medium-run cost effectiveness. Such nations build on what is already available or convenient, and they usually import technology sold by transnational corporations. Even nationalistic LDC's advancing towards socialism, such as Chile, can readily remain locked in dependence on the capitalist world.[2]

Patents and Oligopolies

A patent is the legal affirmation of a corporation's or person's exclusive right to use a technological process to produce a good or service. According to international law, patents registered in one country are not applicable abroad. If a company fails to take out a patent on its equipment in a country where it operates, someone else can "re-invent" the same or similar equipment and patent it there. Ownership of a patent means a transnational corporation can control conditions for the sale of technology to an LDC, or the use of that technology there by other firms. A transnational corporation that holds a patent can choose who may have access to "its" technological process; stipulate how the technology may be used; and fix the costs for using it. Legal permission to use a patented process is called a *license*, and the associated fees are termed *royalties*. The transnational corporation may (and often does) demand that the licensee confine marketing to a single country. Thus, there is no competition with the transnational corporation's operations in other countries.

Patents thus convert a technological process deriving from new ideas and research into a form of private property used at the owner's discretion. Because technology is already developed in the industrialized countries, and this usage of patents is accepted, LDC's basing their economies on short-run costs do little technological research and development (R & D), as compared to the United States and other industrial centers. R & D in the United States for 1975 is projected to reach \$40 billion, far more than any single LDC's gross national product. [3]

Deliberations for the acquisition and sale of technology depend on the number of patents or the amount of original experimentation done in the past by any two negotiating parties. For transnational corporations negotiating with each other, this is not a serious problem.[4] When bargaining with LDC's on the other hand, transnational corporations are in the highly favorable position of oligopoly, as the United Nations Conference on Trade and Development (UNCTAD) has suggested:

The majority of patents are owned not by individual inventors but by large transnational corporations. The latter use patents for their global business policy . . . For example, 50% of all patents which were obtained by companies and whose corresponding research was financed by the Federal Government of the United States between 1946 and 1962 belong to twenty firms . . . market control and monopolistic concentration is reinforced through the system of cross licensing between companies, which in turn reduces a worldwide oligopolistic structure into a regionally monopolistic one.[5]

Because of their advantageous positions, these large transnational firms can charge LDC's exorbitant prices for their technological hardware and licenses for its use. This exacerbates already unfavorable terms of trade between LDC's and developed countries, terms under which LDC's buy dear and sell cheap.

Whether or not a transnational corporation will spend the time and money to take out a patent on its invention in an LDC is determined in part by its own estimation of whether or not its bargaining power will be hurt by the amount of original skills being developed within the LDC. This means that a transnational corporation keeps a sharp eye on the local universities and research centers so that they won't undercut the foreign corporations bargaining power in the country by patenting a competitive invention on their own. It also means that a transnational corporation must continuously examine statistical compilations of patents in an LDC, government regulations on trade and investment, consumer tastes, advertising needs, and similar matters. [4]

Transnational corporations want to control the conditions under which they can license technology to LDC's. They want to retain their monopoly on technology. Thus, they denationalize LDC patent activity. A limited number



Bohemia (Cuba)

**Table 1: Percentage of Total Patents Granted Which are Foreign in Origin
1957-1961 [1]**

<u>Large Industrial Countries</u>		<u>Smaller Industrialized Countries</u>		<u>Developing Countries</u>	
USA	15.72%	Italy	62.85%	India	89.38%
Japan	34.02%	Switzerland	64.08%	Turkey	91.73%
Fed. Rep. of Germany	37.14%	Sweden	69.30%	Egypt	93.01%
United Kingdom	47.00%	Netherlands	69.83%	Trinidad and Tobago	94.18%
France	59.36%	Luxemburg	80.48%	Pakistan	95.75%
		Belgium	85.55%		

of corporations is expanding control over technological processes to an increasing number of countries. Tables 1-3 demonstrate how completely foreigners have penetrated, denationalized, and taken over patent activity in selected countries.

Table 1 shows that 90% or more of patents granted in representative LDC's are foreign in origin. This compares with only 16% foreign patents in the United States and 63% in Italy (1961). The United States has maintained its advantageous positions in patent activity since 1940, as compared with the other major industrial powers in the capitalist world. The United States is the only capitalist nation to retain clear-cut control over its own patent activity. Table 2 reveals that private companies account for the bulk of patents registered in Chile between 1955 and 1969, and that foreign corporations account for over 90% of all registered patents by 1969 (compared to about 70% in 1955). Table 3 makes the trend toward denationalization even more manifest—from 65.5% foreign in 1937 to 94.5% in 1967.

In developed countries, on the other hand, great amounts of R & D work prevent such extreme denationalization. Meanwhile, the relative lack of experimentation in LDC's makes it easier for foreign enterprises, especially those from the United States, to penetrate them. D.S. Gorman, President of Western Electric, confirms the importance of foreign patenting:

Western Electric handles all the foreign patenting for all the Bell system in addition to our own domestic patenting. Currently the Bell system has almost 9,000 patents in the United States and more than 10,000 in foreign countries.

Now, using just one year as an example, this involves some 2,500 patent applications. Of these about seventy per cent are duplicates filed in patent offices outside the United States. It takes an organization of 18 full-time professionals in our company to oversee this foreign operation. We also hire the services of patent agents in foreign countries to submit and prosecute our cases in full compliance with local practice. The cost of this foreign patent operation is running close to \$2 million a year.[7]

The patent division of the transnational corporation is considered so strategic to its ability to control the sale of technology that in 93 companies surveyed in the U.S., roughly one-third (31) had their patent divisions directly subordinate to one of the firm's top executives.[3] These patent departments use the strategy of "defensive patenting" to ease future licensing or direct penetration, or to protect

Table 2: National and Foreign Patents Registered in Chile [6]

	1955	1962	1963	1964	1965	1966	1967	1968	1969
Total Patents of all types	547	883	430	496	590	739	1290	1107	1182
Total Foreign Patents	478	828	402	451	552	699	1229	1045	1110
Total National Patents	69	55	28	45	38	40	61	62	72
Total National and Foreign Patents Registered by Enterprises	403	739	371	423	510	644	1111	949	1076

Table 3: Percentage of Patents Granted in Chile According to Origin [1]

	<u>National</u>	<u>Foreign</u>
1937	34.5%	65.5%
1947	20.0%	80.0%
1958	11.0%	89.0%
1967	5.5%	94.5%

existing and future export markets from potential competition by national firms of other countries. Defensive patenting generally prevents a competitor from using the invention, and thus impairing the enterprise's own current or planned production.[8] In Peru, of 4,872 patents granted between 1960-1970 in major industries, only 54 (about 1%) were actually in use. During the same year in Colombia, of 3,513 patents registered in major industries, only 10 were then in use. Defensive patenting occurs in almost all of Latin America's industrial sectors. As the UNCTAD study notes, "the repercussions of this lack of competition could imply significant price increases, with negative income and balance of payments effects on the countries concerned." [1]

This is not a static situation, however. Most corporations are now more interested in exporting investment capital than in exporting manufactured products to Latin America; their investments in industrial sectors in many LDC's are rapidly increasing. According to *The Rockefeller Report on the Americas*, U.S. direct investment in Latin American manufacturing industry increased during the 1960's from one-fifth to one-third of all U.S. investments. In many previously undeveloped sectors, transnational corporations often have secured monopoly control of markets by prior patenting and continuing control of developed technology.

In the case of Chile, in 1969, forty-seven large foreign companies controlled 53.7% of the total number of patents registered that year by all foreign and national companies. [6] A sample of foreign-owned subsidiaries surveyed in Chile revealed that 50% "had a monopoly or duopoly position in the host market." [9] The UNCTAD

study suggests that foreign corporations divide markets among themselves: "arrangements of patent cross-licensing among transnational corporations, cartel agreements, tacit segmentation of markets . . . (etc.) often constitute common behavior rather than the exception." [10] By 1970, more than 100 U.S.-controlled corporations, with investments worth over \$1 billion, were operating in Chile. [11] Twenty-four of the top 30 U.S.-controlled transnationals were involved. Two-fifths of Chile's largest 100 corporations were under foreign control, while many more are under foreign influence because of the oligopolistic control exerted by the transnational 'giants' over markets and technology. Among these giants, the American ones have a dominant position. The U.S. accounts for more than two-thirds of the total receipts based on patents and licenses accruing to the capitalist nations most actively involved in patents.

Patents as First Line of Foreign Penetration

Table 4 further shows the position of United States with respect to receipts from technology contracts. The United States far outranks its competitors in amount of licenses, direct investment, and loans. The relationship between licensing technology and direct foreign investment is one of mutual reinforcement. [1] Furthermore, the case of Chile illustrates that the employment of patented technology precedes the eventual takeover of a nationally controlled corporation. Historically, a U.S.-based transnational corporation has penetrated a market like Chile's roughly as follows: First, there is a small direct investment; second, generous amounts of credit are offered (in most cases coming from capital generated within the foreign country of operation); third, a patented process is provided, and a testing period ensues. This technology in and of itself may unleash productive forces which will eliminate competition and virtually conquer the market. Once the market is conquered and tested out for future profitability, the transnational corporation can increase control by taking over any remaining competing national companies, by participating with local capital in joint ventures, or, optimally, by setting up its own subsidiary to send not only royalties but all profits directly to the parent company. In Chile, the copper fabricating and explosives manufacturing industries illustrate how the transnation-

Table 4: Foreign Penetration of Chilean Economy [1]

Investing Country	Number of Licenses	Total Volume of Foreign Direct Investments (1964-1968 inclusive)	Total Volume of Foreign Private Loans (1964-1968 inclusive)	Total Receipts, Intermediate and Capital Goods, from Royalties and Profits in 1969, corresponding to 399 technology contracts
USA	178	\$43,103,000	\$120,299,000	\$16,349,000
Fed. Rep. of Germany	46	14,517,000	28,181,000	4,238,000
Switzerland	35	2,941,000	18,250,000	3,949,000
United Kingdom	30	2,264,000	8,121,000	3,896,000
France	17		6,051,000	2,606,000
Canada		25,161,000	4,789,000	

al corporations that received the largest amount of royalties also were responsible for the major provisioning of technology and had majority ownership of the corresponding Chilean subsidiaries. Thus, the monopoly privileges inherent in the existing patent system supply one of the instruments with which foreign companies can acquire national companies through foreign investment.[1]

Transnational corporations concentrate patenting in strategic areas of Chilean industry (Table 5). Transnational corporations originally patented in these areas of the Chilean economy in order to restrict production to themselves. But they also use patents to circumvent the threats of nationalism, as John R. Shipman has explained in the *Harvard Business Review*:

If management desires to expand the company's manufacturing facilities in a country whose government is controlling expansion, the fact that an expanded facility would make available to the economy products protected by the company's patents and therefore not otherwise available may assist materially in working out an arrangement satisfactory to the government. [4]

Since the Chilean government legitimizes transnational corporate control over technology, by granting them patent privileges inside Chile, Chilean tariff laws to protect new industry become less meaningful.

The transnational corporations sell technology in packages; the purchase of part of the package is made difficult if not impossible, and extremely costly. Each particular piece of technology is necessary for the continued operation of the productive process. Therefore, the transnational corporations are assured control of the production in the LDC's economy by the monopoly of technological supply in the strategic sectors. UNCTAD explains that "know-how represents a part integrated in a larger whole".[1] However, it is not "know-how" as neutral technology that is included in packages, but the capitalist production system itself masquerading as an objective science. Such non-competitive conditions also serve to rebuff all but the most complete nationalist threats (as in present-day Chile, where the refusal to continue technological supply is causing serious bottlenecks in the economy).

Transfer Pricing and Technological Dependence

One major advantage that a transnational corporation has is its ability to carry out, between its subsidiaries in different countries, dealings that frequently allow evasion of taxation or other legal restrictions. By manipulating the prices charged for machinery, technological services or final products, sold between affiliates of the same company, the actual operating profits and assets of any particular subsidiary can be altered at will, compensated by corresponding modifications in the books of other subsidiaries or the parent company. This flexibility enables a global

Table 5: Percentage of Patents in Selected Economic Sectors Registered in Chile by Foreign Corporations [6]

	<u>1962</u>	<u>1965</u>	<u>1968</u>
Chemicals, Rubber and Coal Derivatives	93%	99%	97%
Machinery, Metallurgy	71%	81%	78%

corporation to minimize the overall impact of taxes or other regulations it must deal with. (Of course most such constraints are mild to begin with due to the influence of business over government in general). In short, anything traded among a parent company and its subsidiaries, including raw materials or management consultation, can involve this procedure, called *transfer pricing*. "By underpricing exports and/or overpricing imports a subsidiary can extra-legally transfer earnings to another location in the world." [12] Some countries, like Chile, tax corporate earnings at a relatively high rate. These taxes however can be substantially reduced by underpricing goods exported to subsidiaries in countries with low corporate taxes, like Panama or Puerto Rico. At the same time, a company's imports into a high tax area can be overpriced so that the local subsidiary can show higher costs and thus lower taxable profits on its books. Similarly, laws limiting the repatriation of profits (removal in hard currency to, for example, U.S. owners) as, again, in countries like Chile, can be overcome by transferring funds via transfer pricing to other countries, like Argentina, which have weak laws. Another motivation for overpricing imported capital goods by transnational corporations is to inflate the book value of their investments thereby allowing higher depreciation and hence lower taxes. Overvaluation by ITT of its investments in the Chile Telephone Company was a principal issue in the government's move against ITT.

A total of 40%-60% of all Latin American trade comes under potential transfer pricing. U.N. data illustrate the impact of transfer pricing on imports:

In the Colombian pharmaceutical industry a sample taken indicated that the weighted average overpricing of products imported by foreign owned subsidiaries amounted to 155% while that of local firms was 19% . . . Smaller samples taken in the same industry in Chile indicated an overpricing of imported products in excess of 500% . . .

Similarly in the electronics industry in Colombia comprehensive samples corresponding to firms that controlled about 90% of the market indicated overpricing which ranged between 6% and 69%. [13]

A study of 258 exporting firms in 10 Latin American countries, representing 25% of the region's manufacturing exports, reveals the magnitude of the capital los-

ses from export transfer pricing. The average undervaluation of exports was 45% representing "a loss in foreign exchange earnings of almost \$500 million which for 1970 was roughly 4% of officially recorded total exports". [12]

In most LDC's the choice has been made to rely heavily on foreign investment and technology, typically provided by transnational corporations. The sale of capital goods and technological know-how has therefore become a key avenue for transfer pricing, siphoning capital out of the LDC's. As UNCTAD points out:

For the whole of Latin America it has been estimated that during the period 1960-1965 about \$1,870 million were spent annually for the importation of machinery and equipment. These imports amounted to 31% of the total import bill of the area. They also constituted about 45% of the total amount spent by Latin America on capital goods during the same period. For individual countries this relationship amounted to 28% for Argentina, 35% for Brazil, 61% for Colombia and 80% for Chile. [1]

The UNCTAD study goes on to estimate that about "one-third of total imports of machinery and equipment in Latin America are made by foreign-owned subsidiaries".

Patents as a Last Line of Defense

Transnational corporations of course prefer the freest possible access to investment opportunities in LDC's, using whatever technology and capital best suited to their global plans. There is however some opposition, even from the local capitalist elites. Increasingly often transnational corporations have had to conform to strict new laws requiring for example joint ownership, minority foreign ownership, or even expropriation. The existence of technological dependence of course plays a strong deterrent role in these matters, as Robock points out in the *Columbia Journal of*



World Business: "When a firm's Research and Development capability is located outside of a high political risk country, expropriation would be self-defeating because it would cut off the flow to the subsidiary of badly needed technological know-how". [14] Nevertheless, the transnational corporations are planning ahead for the "new nationalism sweeping the third world". A recent report *Nationalism in Latin America* by Business International (BI, a consulting firm for transnational corporations) cites an OAS document which suggests "that a new era of international investments has dawned, in which the predominant characteristic is the exploitation of technology, as opposed to the previous one, which was frequently abusive, characterized by the exploitation of the natural resources of the country." The BI report goes on to argue:

control of technology is just as important as control of equity, and easier for a foreign firm to wield, since it permits penetration without the least exposure to the vicissitudes and controls of the local market . . . If licensed technology and management contracts can afford sufficient income and control without equity ownership, all the better in terms of economic nationalism . . . Be prepared to bend on equity. Sometimes it is better to settle for only 25%, with a management contract or a tight licensing agreement to control technology and marketing, rather than insist on a majority. This would defuse nationalist charges that foreigners are drawing out unjust profits, since the local partner will get the bulk of the profits while you are well compensated for services demonstrably rendered.

In fact, BI goes so far as to suggest to its clients that they "examine the possibility of accepting exports from licensees in lieu of royalty payments". [15]

This is especially significant in the case of Chile, since its government has threatened to prohibit all future royalty payments. Indeed, most of the transnational corporations operating in Chile, while favoring the Allende government's overthrow, may nevertheless be prepared to adjust to the new status quo, if Chile's incipient socialism cannot be reversed. This obviously applies less to ITT, Kennecott and Anaconda whose assets have been or will be nationalized. Others, such as R.C.A., Armco Steel and Cerro Corporation however are trying "not only to remain, but to strive to promote formulas of association with the government". [16] That transnational corporations can sustain a comfortable involvement in LDC's even in the face of seemingly serious challenge is an indication of the hold they have, at least partly through technological dependence, over the LDC's. As Rodman C. Rockefeller of International Basic Economy Corporation (IBEC, a Rockefeller family non-oil investment hustle in Latin America) explained to a meeting of the Council on Foreign Relations (CFR, see p. 21) "it is not unsatisfactory to do business with Marxists once a basis of export and import conditions have been established". [17]

Regional Integration, Diversification and Technological Dependence

Many development-minded government technocrats in Latin America especially the Peruvian military elite (!) see regional integration such as put forward in the Andean Pact as a defense against transnational corporations and a stimulus for development. The Andean Pact supposedly will prohibit defensive patenting. However for this integration to be effective, all the participating countries would have to pass and enforce strong anti-monopoly laws since penetration of any one of these countries means penetration of all of them as internal tariffs are removed. This is not the case, as exemplified by Colombia which has a weak law on defensive patenting. [18] Thus the creation of the Andean Common Market is not viewed as a disaster by the transnational corporations. They are already pitting one Andean country against another and carefully choosing where they will place their particular patents and investments. BI calls this a "rationalization strategy": "remove present export restrictions on selected licensing agreements to enable licensees to export to nearby markets now being supplied from other sources" [15]

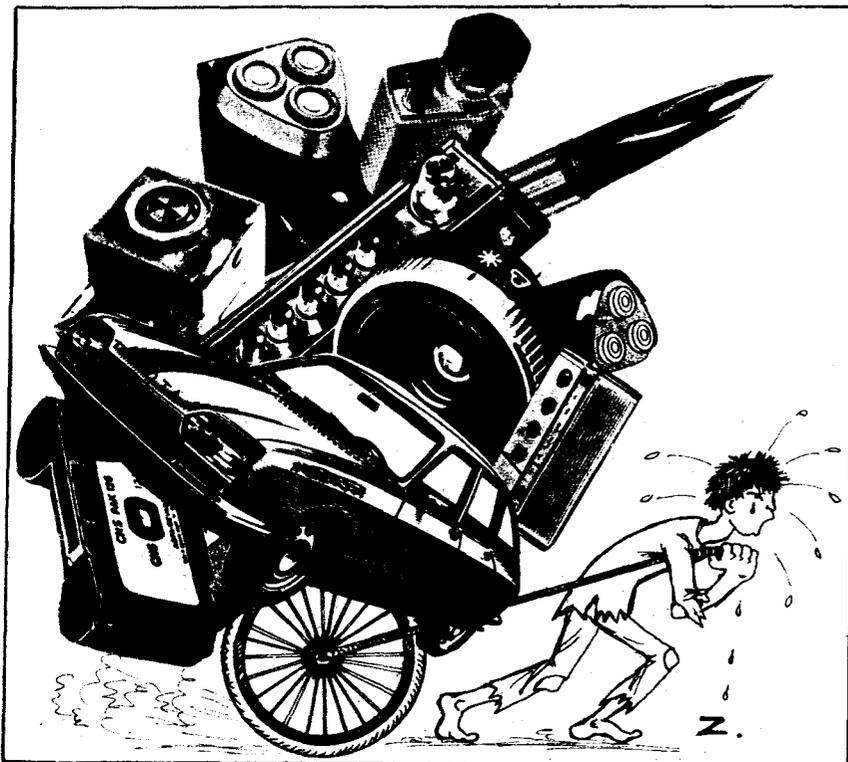
Some developmentalists, especially among Chilean technocrats, see the diversification of trade and sources of imported technology as a greater hope for advancement. They have come to realize, furthermore, that diversification within the capitalist world, to include European competitors to U.S.-based transnationals is not sufficient. However, within the current framework, even were Chile to find alternative technology on better terms from 'socialist' countries, there would still remain the problems

of "conditions", patents, foreign know-how, repairs and parts, shipping costs, familiarizing workers with new technology and operation manuals, etc.

The Cult of Technocracy

Patents and associated business practices of transnational corporations form the essential basis of technological dependence. There is a social and cultural dimension to technological dependence which perpetuates the problem. Deriving in the first place from the lopsided class structures within LDC's and the international stratification of wealth and power, technological dependence permeates, even shapes, the very structure of social classes and the consciousness of different class groupings within LDC's.

In most LDC's, patented technology is used to produce goods for a small percentage of the population who can afford them, rather than to meet the most important needs of the majority of the people. Items which the ruling elite and upper-middle and middle income groups can afford to consume are what are generally copied and produced. Foreign standards of production and consumption generate a materialistic, consumer-oriented elite and middle strata which increasingly imitate the life styles of affluent families in the more developed countries. Besides basic industry, many small businessmen are also dependent upon the presence of transnational corporate technology and are locked into its productive process through partial ownership, management, sales, or services. LDC elites and middle strata come



Chile's President Allende

to define the continued presence of such technology as being within their own class interests. Their life style is shaped by the technology that allows it to exist and is reinforced by a form of ideological, or cultural, dependence characterized by the "cult of technocracy." [19] As in the "advanced" countries, technology is portrayed as a neutral benevolent force. Reliance on "experts" is encouraged, especially among the technocrats many of whom are caught up in the language and practice of U.S., European and Japanese technology and trade.

The case of the automobile industry in Chile illustrates this point. On October 19, 1971, the government announced: "Nine foreign firms have been competing to win a government auto contract. These foreign firms are Fiat, Peugeot, Pegaso, Nisan, Volvo, British Leyland, Citroen, Fap Famos, and Renault. Those firms that win the contract will produce the autos and will form a joint venture with CORFO [the Chile Development Agency], in which CORFO will have majority interest." [20] Allende's government has since started to produce small and intermediate size cars for "popular" consumption. An expansion of roads and parking facilities has resulted, although a study by an American economist, David Barkin, has shown how "the automotive program is incompatible with a progressive program of income distribution . . . The tendency [to produce cars and construct parking lots] would exacerbate the existing inequalities rather than facilitate structural change." [21] The technicians, social planners, economists, engineers and similar professionals—many of whom consider themselves to be revolutionary—who suggested the above plan for Chile are so wedded to modern technology and immersed in the internationally honored system of patents that they tend to limit their options accordingly and thereby become one of the more influential human forces inside Chile in continuing Chile's dependence. The most influential force within Chile perpetuating dependence, of course, remains the bourgeoisie itself.

The cult of technocracy is a crucial ideological creator and perpetuator of economic dependence because it so elevates and mystifies technology as to make independent experimentation next to impossible. Workers and peasants are excluded from control over technology and made to feel "unprepared" to tackle technological questions, even at the local level of broken parts, repairs, etc.

In almost every case where the Chilean Government has moved against U.S. transnational corporations, the corporations were allowed to retain their control over technology. [22] This has been true with such corporations as General Tire and Rubber, Armco Steel, Dow Chemical and others. Dependence is thus being maintained in Chile on both an economic and ideological level.

Furthermore, the cult of technocracy, and the technocrats who officiate over it, can serve as a potential power base for reactionary ideas to build upon. The cult of technocracy aids the transnational corporations by encouraging Chileans to continuously look towards the metropolitan countries as an answer to their problems.

The elimination of technological dependence through the patent system is an essential part of the process of

radical social change. However, even countries whose class configurations are radically changing find it difficult to surmount the ideological problem of the "cult of technocracy". For example, the Chinese, by their own accounts, confronted problems of relying too heavily on the expertise of Soviet technicians in the 1950s. And a decade later, during the Great Proletarian Cultural Revolution, one of the major ideological directions of the revolutionary process was the struggle against dependence on China's own "experts" with a renewed revolutionary emphasis on "self-reliance" at every level of society, including that of the technocrats themselves, who were instructed to go "to the people, in order to learn from the people."

Based on our research, we conclude that patents—technology as private property—are an inherent feature of the capitalist social order which is itself based on an oppressive class structure. Genuine development in the interest of the working people, with technology in the service of the people, will occur only when that class configuration is dissolved and, in the process, the patent system eliminated.

D.Z., J.C.

NOTES

[1] Junta del Acuerdo de Cartagena, *Transfer of Technology*, United Nations Conference on Trade and Development Secretariat (UNCTAD), TD/107, December 29, 1971.

[2] To an extent, the same problem of technological dependence might be indicated within the socialist world, insofar as we may judge, for example, from the Chinese polemic against the Soviet Union's aid program in the 1950's. However, our primary concern here is with economies based on cost and capitalist market relations, especially Latin American and the metropolitan capitalist countries.

[3] Yu. A. Sergeev and N. Y. Strugatshya, "Scientific and Technical Development, the Monopolies and the Patent System," reprinted from *Russian Research Journal S.S.A.: Ekonomik, Politika, Ideologiya in Idea*, v. 15, no. 2 (Summer, 1971).p. 327. It should be noted that private U.S. corporations that have been granted research funds from U.S. federal agencies retain all patents coming out of such research, except in cases where the contracts for the R&D are concluded with the Atomic Energy Commission or NASA. The General Electric Corporation has thus been able to obtain 471 patents at the expense of U.S. taxpayers (p. 328). According to George Summers, representative of Fairchild Industries, Inc., more than half of all R&D funds in 1971 came from the federal sector (\$15.5 billion out of \$27.8 billion), mainly the Defense Department. See his address at the Proceedings of a Special Conference on Technology, reprinted in *Idea*, v. 15, no. 3 (Fall, 1971) p. 451.

[4] John R. Shipman, "International Patent Planning," *Harvard Business Review*, March-April, 1967.

[5] UNCTAD, "Oligopoly" is defined as "A market situation where independent sellers are few in number. Neither the monopolist nor the purely competitive firm must consider how alternative actions by rival firms will affect its own revenue possibilities—the monopolist has no rivals and the competitive firm has so many that it can ignore any one of them. Oligopolists not only have rivals but they have so few of them that each is large enough to affect the others significantly. Their prices, outputs and other relevant variables are therefore indeterminate." *International Encyclopedia of the Social Sciences* (1968 ed.), p. 283.

[6] Alvaro Briones, "Los conglomerados transnacionales y la integración del sistema capitalista mundial: el caso chileno" (Working Document, Centro de Estudios Socio-Economic, Facultad de Ciencias Economicas, Universidad de Chile, 1972). Briones' data utilized here and later in this analysis have been

published, in summarized form, by *Chile Hoy*, no.'s 31, 33, and 34 (Jan. 12-Feb. 9, 1973).

[7] Cited in Thomas Ritscher, "Foreign Patent Applications and Patents" *Idea*, v. 13, no. 1 (Spring, 1969), p. 133.

[8] *Industrial Property*, monthly review of the World Intellectual Property Organization (WIPO) and the United International Bureau for the Protection of Intellectual Property (BIRPI), Geneva, Switzerland, no. 9 (September, 1972).

[9] UNCTAD. The word "monopoly" may be defined as "unified or concerted discretionary control of the price at which purchasers in general can obtain a commodity or service and of the supply which they can secure or the control of price through supply as distinct from the lack of such control which marks the ideal situation of perfect competition," *Encyclopedia of the Social Sciences* (1930 ed.) pp. 623-630. Duopoly or bilateral monopoly can be described as a market situation wherein "a monopolistic buyer purchases from a monopolistic seller, in which two requisites of production jointly demanded are (separately monopolized)" *Encyclopedia of the Social Sciences*, (1930 ed.) v. III, p. 628.

[10] UNCTAD. Cartel "designates an association based upon a contractual agreement between enterprises in the same field of business which while retaining their legal independence, associate themselves with a view to exerting a monopolistic influence on the market." *Encyclopedia of the Social Sciences*, (1930 ed.), v. III, p. 234.

[11] James D. Cockcroft, Henry Frundt, and Dale L. Johnson, "The Multinationals," in Dale L. Johnson (ed.), *The Chilean Road to Socialism* (New York: Doubleday-Anchor, 1973). Revised and expanded in Spanish as "Las companias multinacionales y el gobierno de Allende," in *Huerquen-Boletin de Noticias del Banco Central de Chile*, no. 4 (Nov. 20, 1972) and *Punto Final*, v. VII, no. 171 (Nov. 21, 1972); also, *Siempre* (Mexico City), Sept. 13, 1972.

[12] Ronald Mueller and Richard Morgenstern, "Economic Evidence of Multinational Corporate Behavior: Transfer Pricing and Exports in Less Developed Countries". Unpublished manuscript, Fall, 1972. Copy available on request from Professor Ronald Mueller, Department of Economics, American University, Washington, D.C.

[13] UNCTAD. "Overpricing" in this context is defined as the following ratio: 100 x FOB prices on imports in Andean countries (A), minus FOB prices in different world markets (B), divided by FOB prices in different world markets (B), thus,

$100 \times \frac{(A-B)}{B}$

. This takes into account the fact that transfer pricing of technology by transnational corporations on a global

basis can result in overpricing of technological imports by national firms in Latin America.

[14] H. Robock, "Political Risk: Identification and Assessments," *Columbia Journal of World Business*, July-August, 1971, p. 14.

[15] Business International Corporation, *Nationalism in Latin America*, September, 1970.

[16] *Chile Hoy*, Nov. 24-30, 1972, p. 11.

[17] Cited in NACLA's *Latin America and Empire Report*, Nov. 1971.

[18] *Industrial Property*, no. 5 (May, 1972), p. 130 (extract from Article of the Colombian Patent Law).

[19] The concept "cult of technocracy" is a visceral one familiar to any worker having to approach a government bureaucrat, engineer, doctor, or plant manager, as well as to intellectuals who have studied problems of industrialization, technology, and economic development. There already exists an abundant literature on the impact of technology upon people's value systems and daily lives. We employ the concept "cult of technocracy" for many reasons. First, it is a "cult" because so many people have come to accept its dynamics of expertise, specialization, unique skills, and unquestionable authority, on a level of both "common sense" and respect, admiration, or worship. Second, it is a "technocracy" because a cross-section of classes and personnel exists which in effect behaves as a technologically shaped and informed group which carries out tasks from positions of power and authority both in government and in economic production. Third, it is an ideological phenomenon because so many people accept, believe in, and live by the cult of technocracy, however severe the frustration or alienation which accompanies it. The cult of technocracy is especially applicable to an analysis of Western countries and LDC's dependent upon advanced capitalist nations. Many so-called "Third World" countries, such as China, North Korea, Vietnam, Cuba, and Tanzania, have developed ideologies which attack the cult of technocracy with varying degrees of success. However, as the case of the Soviet Union suggests, the introduction of 'socialism' is no guarantee that the cult of technocracy will disappear merely by the elimination of capitalist modes of production.

[20] Presidencia de la Republica, Oficina de Informaciones y Radiodifusion, *Calendario del Area Social* (nov. '70-abr.'72), p. 8.

[21] Emphasis added by David Barkin, "Automobiles and the Chilean Road to Socialism," in Dale L. Johnson (ed.), *The Chilean Road to Socialism* (New York: Doubleday Anchor, 1973).

[22] Robinson Rojas, *El imperialismo yanqui en Chile* (Santiago: Ediciones MI, 1971), p. 88.

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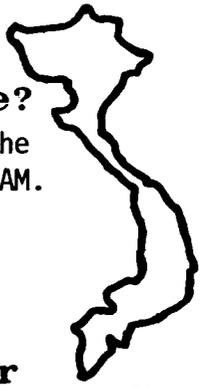
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Letters

We believe that the general liberation of all people will require struggle. In order for women to participate fully in that struggle they must be able to control their reproductive lives.

For further discussion of some of these issues, as well as information on specific programs of population and birth control, see the upcoming issue of *Science for the People* to be produced by the Women's Issue group.

In struggle,

Isa Bernardini
Nancy Stoller Shaw
Jenny Thie

Dear Friends,

We are writing in response to the articles "Rx for the People" and "Pogrom for Progress" by Bonnie Mass in the March issue of *Science for the People*. While the articles dealt with important issues, we feel that some crucial aspects of the relationships among birth control, population control, and imperialism were overlooked. Her condemnation of birth control programs in Latin America offered no specific standards by which to judge individual projects. Thus, we wish to offer some possible guidelines:

1. We should isolate and reject birth control programs with genocidal intent or consequences. This includes programs whose main component is sterilization, and those which rely on material incentives, threat, force, or penalties for non-participation, whether the penalties are directed at individuals or at the recipient countries. (Within the U.S. the penalty for an individual is sometimes the loss of welfare aid; the penalty for a country may be the loss of general economic aid.)

2. We should reject birth control programs where the recipients are the victims of misinformation, no information, or inadequate information about the nature and consequences of the procedures or medication.

3. We should reject birth control programs which involve dangerous or unnecessary experimentation. This was pointed out by the Philadelphia Women's Health Collective in the same March issue of *Science for the People*.

In all these cases scientists and other individuals can take both offensive and defensive roles. The offensive role is to demand of each new program that it meet these standards of safety and free choice based on full knowledge. If the researchers and sponsors cannot or will not meet these demands, the program should be terminated. On a defensive level, we can locate and pass on information about contraception, abortion, sterilization, and other population programs throughout the world to their potential recipients and/or victims. We urge women and men to help now, so that women in each place can determine for themselves whether to participate or how to restructure such programs for their own benefit and not for the profit or power of a drug company, a physician, a business elite, or an imperialist government.

Dear David,

. . . I have been feeling out the reactions of my colleagues (and reflecting on my own) to *SftP*. I think there's unanimous agreement that the publication is informative and thought-provoking (argument-provoking, too—and that's good). However, everyone I've given the mags to has commented upon the stale radical rhetoric. I'm afraid I must concur. I served my time in SDS as an undergraduate (1965-1969) and gradually broke away from the group (noble though their motives and gripes were) because I got tired of listening to their crappy overstated way of delivering their message. I'm afraid I react the same way to *SftP*. I wish you had a quelch editor—someone who would reread all the stuff to be printed and get rid of the emotionally-loaded words which the radical left has (unfortunately) polluted for evermore for many of the very people *SftP* is trying to reach. For example, it doesn't matter that genocide is the exact word you want—confirmed by the dictionary and by the writings of the U.N. The word is polluted. When I see genocide on a title, I get nauseated—not because of the presumed *act* of genocide, but because 9 times out of 10 when that word is used, it is misapplied by knee-jerk radicals. The word evokes strong responses, in me, anyway, toward the writer, not the perpetrator of the act. Maybe I'm not alone. . . .

The content of your magazine is so super; the emotional gilding is spoiling it.

Regardless—I shall continue to support your group in any way I can.

Best of luck to you
and SESPA. Keep
up the good work.
Marty Robards

Because the charge of 'rhetoric' mongering is frequently made against radicals, often with some basis, we think a comment is in order. The rulers of America and most of the world are conscious architects of crimes against the people—Americans and others—for which no rhetoric could overstate the case. Furthermore, many politicians

Letters continued on p. 43

ENVIRONMENTAL COLONIALISM

The following is our adaptation of an article on environmental colonialism in Puerto Rico. The original form of this article was published in the February 4, 1973 issue of Claridad (the Puerto Rican Socialist Party newspaper). The PSP reviewed our adaptation and gave us permission to print it.

Puerto Rico's land and people have been increasingly threatened by industrial pollution from U.S. corporations which dominate their economy and inhabit their environment. To comprehend what is happening to the Puerto Rican environment, we must understand recent developments in the United States, beginning in 1946 with the great post-war expansion of the U.S. economy. This expansion was based on a technological transformation of American industry. New developments in technology have had a tremendous impact on the people, an impact that the older forms of technology had to a lesser degree. The new technology, moreover, did not safeguard the natural environment, i.e., the ecosystem in which people live.

An ecological cycle involving industry can last indefinitely if allowed to purify itself; if the waste at any step is used as raw material for another. However, such a self-regulatory mechanism is not possible if economic growth is concentrated in industries particularly destructive to the environment. The destruction of the environment has taken place in the U.S. with growing intensity, and its effects are everywhere: in rivers, lakes, bays, mountains, in crops, the air, the cities, and the health of the people. As a consequence, large numbers of people, even some elements of the business elite, have taken up the issue and have fought against the big polluting industries in popular campaigns, courts, local elections, state legislatures and the Congress. The increasing tempo of this struggle, a product of contradictions within the system and among sectors of the ruling class, has resulted in U.S.

business and government adopting the policy of exporting pollution.

What has happened in the U.S. is that increasing pollution is no longer acceptable. This is why U.S. industry now seeks a low cost dumping ground, in addition to raw materials and cheap labor, in other countries, where restrictions are still minimal. We can find hints of this policy in a publication of the Presidential Commission on Trade and Foreign Investment of July 1971. We read:

We [North Americans] cannot expect that developing nations will accept our priorities [concerning the environment] if they don't have our level of well being. Therefore, . . . the developing nations must be stimulated to develop their own programs for the environment, adequate to their circumstances . . .

In other words, this Commission is recommending that the developing countries establish low pollution standards because of their poverty. However, it is obvious that this would merely allow rich foreign corporations higher profits in these countries. In a more direct way, a 1971 United Nations document asserts that there are no reasons: "why the developing nations shouldn't specialize in different industrial areas . . . that will become very expensive for the developed world because of their growing concern with pollution."

By the late 1950's, it also became evident that the U.S. Government was negotiating tariff agreements with the European Common Market. Imported products would then flow into both the U.S. and Puerto Rico due to lowering of tariffs and thus, through competition, would eliminate the Puerto Rican industries that manufactured the same products. These industries were the ones that provided most of the jobs for the Puerto Rican people. In addition, there was the situation that Puerto Rican wages were rising above those of other less developed "cheap labor" countries, as in Southeast Asia, for example. This resulted in the "light" industry moving to areas which had lower wage demands (light industry requires a larger work force). These industries were replaced by "heavy" industry (which requires a smaller work force and more machinery). This kind of industry can operate more profitably under these conditions because the major costs are for materials and equipment; thus, heavy industry can remain competitive. However, the disastrous result for Puerto Rico's people was worsening unemployment.

Thus, if the colonial government wanted to maintain unemployment at a tolerable level, it had to attract heavy industries at a very high rate, and this is what has been happening in the last few years. But this kind of industry—heavy and medium heavy—has a great drawback: it is *highly polluting and destructive*. The colony, faithfully following the policies of the colonizer, also made no provisions to defend the people's living environment.

Environmental colonialism, then, developed in Puerto Rico as a result of these two factors:

1) A decline in the economic advantage that businesses operating in the U.S. had under the previously minimal environmental protection regulations, and

2) The decision of the colonial government to give priority to developing heavy and medium heavy industry.

The Effects

The most spectacular manifestation of environmental colonialism has been developing recently: the gigantic petrochemical complex on the island of Mona, which will also be a U.S. oil storage and distribution center. In view of the great importance of this project we will look at its background.

The importance of oil rests in the fact that it supplies most of the energy that the capitalist economy needs for its functioning and growth. With no energy, any economy dies away. Until recently energy was very cheap. This was due to the fact that the prices were controlled by the big consumers (U.S., West Europe and Japan). More and more, however, the countries of the Third World, who are the main producers, have become conscious of the exploitation of their resources and have started to raise the price of oil and other fuels. Meanwhile, the energy requirements of the U.S. economy are so great and growing so rapidly that that country is forced to import unprecedented quantities of oil and natural gas, that is, energy, from the Middle East. The cheapest way of transporting more and more expensive oil is in supertankers of 300,000 to 600,000 tons.

But the U.S. does not at present have any deep water port (of more than a hundred feet depth) that these tankers need. Neither do they have enough petrochemical complexes to refine all that oil. The construction of superports, the functioning of the refineries, and the possibility of accidents involving supertankers raise formidable environmental problems. These are the

reasons why the U.S. ruling class and its functionaries are considering Mona. The formidable environmental problems would be suffered by Puerto Ricans and Dominicans.

Moreover, the island has very deep water near its coast and is close to other American oil interests in the Caribbean and near the U.S. east coast, where more than 50% of the energy consumed by that country is used. The U.S. plans for Mona are part of the oil policy assigned to the colonial government for Puerto Rico and they reflect the colonial policy of *importing pollution*. In fact, besides the Mona project, plans for another petrochemical plant on the island have also been announced.

The role assigned to Puerto Rico by the colonial government and the big American companies goes much further than this. Investigative studies on the environmental effect of large copper and aluminum plants are being prepared. The establishment of copper producing plants would initiate the large scale exploitation of our important deposits in the Central mountains. In the same line of thought, against Puerto Rico and against ecology, 15 more pharmaceutical plants are planned in the north of the island and 15 nuclear reactors to produce electricity. This type of exploitation of Puerto Ricans, their environment and natural resources must be checked.

In the present, 1973, the great capitalistic experiment continues to threaten the life and environment of Puerto Rico. This is an experiment that no civilized country has a right to perform, and less so if it is done to provide profits, wealth and power to the ruling class.

Today, while you are reading this article, refuse is being dumped in the air, water, land, and coast of our island, which include: noxious gases, heavy metals, particulate matter, hydrocarbons, acids, dyes, pesticides, antibiotics. Most of them are capable of inducing cancer in humans; others can produce genetic damage. Already traces of these dangerous elements have been found in the fat tissues of Puerto Ricans. Many of these elements pose terrifying threats to the health of Puerto Ricans and their children. Malformation of the next generation is a fright-



ening possibility if Puerto Ricans are exposed to too many of these dangerous elements.

It would be possible to indicate some other facts of the same kind which jeopardize the way of life and safety of each Puerto Rican. The location of industries in areas not able to deal with industrial waste has caused contamination, as in the case of Sun Oil in the Yabucoa Valley. Extremely high incidences of mental retardation, asthma, and cancer were found in areas surrounding pharmaceutical firms. One such tragic example was the village of Playa de Guayanilla, bordering the CORCO petrochemical complex. There, a team of doctors has found asthma, emphysema, and chronic bronchitis in the lungs of one third of the population of the village. The same district is subjected to a daily release of pounds of mercury (an active poison) from the Pittsburgh Plate Glass Company. The economic policy assigned to Puerto Rico threatens the lives of our people while yielding profits for foreign investors.

But this is not the whole story. Nowadays, day by day, oil tankers of up to 100,000 tons go in and out of the harbors. They pose a permanent threat of an accident, spilling thousands of tons of oil over our bays and coasts. There are serious problems related to garbage disposal in each and every one of the municipalities of the island. Deforestation, thermal contamination, felling of mangroves, and an urban growth spreading all over the best rural areas, are increasingly apparent. Main highways are being constructed across the island to fundamentally benefit the capitalists. There is an uncontrolled removal of sands in rivers and beaches; rivers are losing their capacity to erode vertically, which affects the sand supplies they provide to the beaches. Scores of wells have been opened in order for the big enterprises to inject potent poisons into the deepest parts of the earth. Free and uncontrolled extractions

of drinking water and the contamination of other reservoirs is allowed. In the 1960's, there were numerous leaks of radioactivity from the Bonus experimental atomic reactor in Rincon.

Progress and Justice

Everything is allowed under the misnomer of "progress"; this is the concept of "capitalist progress". No Puerto Rican woman or man can accept "economic development" that threatens their life and security, the quality of their land, water, and air, and destroys their precious natural resources.

But the colonialists go much further in their cynicism. They want to convince us that the North American model for economic development is the way towards social justice. This model has been applied for the last 20 years in Puerto Rico and hasn't solved any of our big problems. Thirty per cent of our labor force is unemployed, while *one third* of our population migrates to the United States. Thousands and thousands of families are still living in slums, in bad housing. Those who live in housing projects have mortgaged everything. Health care is getting worse and worse. The misuse of drugs and alcohol is increasing in the country at an unbelievable rate.

The wealth remains with those at the top; even hope evades the people. Social justice is farther away than ever before. What is really happening is that social justice is becoming less and less possible with each capitalistic development. The least that can be said about those who honestly believe that the North American model of development will bring social justice is that they haven't lifted their eyes from their books for years, or they are innocent victims of the confusion that colonialism produces.

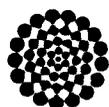
The exploitation of the land and people of Puerto Rico has been fostered and perpetuated by the colonial relationship between the United States and Puerto Rico, recognized belatedly by the United Nations in 1972. In actual fact, Puerto Rico has been a U.S. colony for 75 years, in spite of the fiction of the 'free associated state'. Throughout this period, different forms of exploitation have appeared, the latest embodying the environmental colonialism discussed above. Several groups have entered the struggle against this colonial relationship and its consequences, among them the Puerto Rican Socialist Party (PSP), founded in 1971 as a successor to the Pro-Independence Movement (MPI). The PSP asserts that independence and socialism is the only way to social justice in Puerto Rico, and calls for unity between the Puerto Ricans in the continental United States and those in Puerto Rico in their struggle. The publication of a manifesto and analysis of environmental colonialism by the PSP shows that it is in the interest of the people in less developed countries to work for strict environmental standards as a part of the struggle for independence. People in poor countries should not have to use their health and living environment as bargaining chips for industrial "development" by foreign corporations.

Manifesto to the people on the aggression perpetrated by North American big business against public health and ecology in Puerto Rico.

A NEW FORM OF COLONIALISM

A new form of colonialism has taken shape in the last 10 to 15 years. It consists in using the land, air, and water of the colonized country as dumping ground for poisons and pollutants that the industries from the colonizer country produce. In this way they are able to export pollution and what it costs to fight it outside their territory, avoiding the adverse effects of these wastes on their economy, their public health and their environment. We call this new form of aggression *environmental colonialism*.

Puerto Rico has been suffering this aggression since the early sixties. In fact, it is very possible that today it represents the best example known of environmental colonialism. And as with all forms of colonialism the colonized that operate within the system follow faithfully the policies of the colonizer: the local big industries are allied to the U.S. ones in their aggression against the Puerto Rican health and environment.



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The AAAS is planning a Mexico City meeting, June 20-July 4, under the title "Science and Man in the Americas" This article will try to better explain the context of the meeting and show how "the man" (meaning the system, the ruling class, the bosses, etc.) will be using the occasion.

Today there exists a great multiplicity of U.S. technological aid programs for Latin America. No pretense has even been made that they are charity; rather, it is clear that they are designed to serve the interests of large corporate enterprise, and that such interests lie in the promotion of economic growth within the capitalist system of private investment. Within this system, science and technology have been used to exploit the natural and human resources of Latin America and to maintain the stability required for continued economic growth. But is growth within this system compatible with real social and political development? Consider the following:

. . . All the evidence suggests that foreign private investment (1) exacerbates inequalities by helping to form and to support a set of foreign and domestic privileged elites within a country; (2) inhibits the development of an indigenous sociocultural unity by absorbing a country into the world-wide capitalist system; (3) aggravates the destructive impact of modernization on community values by promoting an overwhelmingly individualistic ethic; and (4) concentrates substantial decision-making power in a few private hands, many of them foreign. [1]

It is within the context of this system of private investment and the capitalist forms of development, within the context of the main political and economic forces in Latin America, that we must view the function of science and technology. And it is within the context of the function of science and technology that the AAAS Mexico City meeting becomes understandable. The theme of the AAAS Mexico City meeting, "Science and Man in the Americas," is suitably innocuous and gives no clue as to why at this time the AAAS is holding this meeting in Latin America. We might well ask whether, in fact, it is part of a larger picture, a more extensive expansion of U.S. science and technology into Latin America. In the last few years, in the councils of government, around the conference tables of the multi-national organizations (UN, World Bank, etc.), in the ivy-covered halls of academia, and in the offices of the multi-national corporations, an increased emphasis is being placed on the importance of science and technology in (mis)development. The catchphrase often heard is "technology transfer."

Technology transfer in this context means the exportation of U.S. technology to the Third World. While it is an understatement to say this is not a new phenomenon, there is apparently a different emphasis emerging. In the past, private investments were made in Third World countries with little regard for anything but return on capital investment. Great effort was required to contain the inevitable social reaction to the intense exploitation. It thus was necessary, as part of counter-insurgency planning, for the U.S. to recruit social scientists to study foreign cultures and Third World societies.

Now, in addition to the heavy emphasis on counterinsurgency, a new effort appears to be directed toward investing capital in ways which still generate high returns, but which are designed to minimize their disruptive social impact. Consequently we find social scientists setting up study programs on the social impact of technology and on various other aspects of technology transfer. Take for example a recent \$900,000 grant from the Agency for International Development to the Massachusetts Institute of Technology under the title "Adaptation of Industrial and Public Works Technology to the Condition of the Developing Countries". In the introductory paragraph of the contract we are informed that:

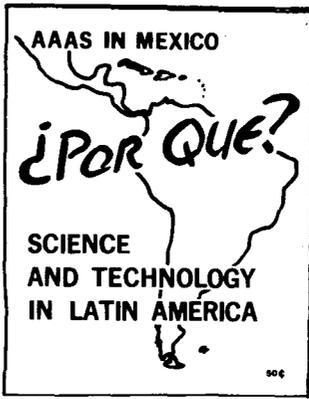
The only process that can bring about that secularly continuing significant rate of increase in real income per capita which we term 'economic development' is progressive and continuing technical advance. Thus, economic development is virtually by definition a process of technical change. Our understanding of this process is, however, inadequate in ways that are relevant to those inside and outside the developing countries who seek to promote orderly and effective growth.(Emphasis ours)[2]

Here the ideology of capitalist development is all-pervasive, and the political stance unquestionably on the side of the status quo. It is thus clear in whose interests and for what purposes this study is being funded.

Another new grant to MIT, this one from the Ford Foundation to MIT's Center for International Studies (part of the Harvard-MIT counterinsurgency think tank), is for \$400,000 and will be spent, in large part, on the development of programs concerning the "International Impact of Technology", "Population and Migration", and "Technology and Development"—all aimed at the Third World.[3] Similar kinds of studies are being developed at Berkeley and Harvard and in Latin American studies centers across the U.S.

Also, in the last couple of years a strong emphasis on science and technology has been reflected in the concerns of the multinational organizations. Large numbers of studies on technology transfer and indigenous technological development appear in the recent publications of the Inter-American Development Bank (IADB or IDB), Economic Commission for Latin America (ECLA), U.N. Food and Agricultural Organization (UNFAO), International Labor Organization (ILO), Organization of American States (OAS), the U.N. Educational, Scientific, and Cultural Organization (UNESCO), and others. In addition the U.N. has recently formulated a World Plan of Action for the Application of Science and Technology to Development, and even more recently (May, 1972) the OAS has held an important conference on the Application of Science and Technology to Latin American Development. What is the significance of all this activity? We must keep in mind that U.S. capital overwhelmingly dominates all of these organizations as well as the individual countries

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SCIENCE AND TECHNOLOGY IN LATIN AMERICA

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WE NEED CONTRIBUTIONS to the production costs of the Spanish version of this booklet which we are making available for the Mexico meeting and for broader distribution in Latin America. Please send donations to Mexico City Group, c/o SESPA/Science for the People, 9 Walden St., Jamaica Plain, Mass. 02130. Venceremos!

themselves (although nationalistic expressions are often tolerated). Within this context, development means *misdevelopment*, and technology is synonymous with capital investment. During the years of the Alliance for Profit* through military and economic pressures, through educational and exchange programs, through foreign "aid", the U.S. has driven most of the governments of Latin America to accept the capitalist model of growth. While technology transfer is in actuality a prescription for increased resource and market control in the hands of multinational finance groups, it is advertised as the cure-all for the poverty of the Third World. Like all drug advertising, the propaganda is clever and deceptive.

Viewed against this background, the AAAS meeting is a very important event. It will provide official AAAS support for the recent surge of activity toward science and technology for the economic *misdevelopment*, and U.S. control, of Latin American (African and Asian) countries. The principal tenets of underlying ideology are, (1) that science is politically *neutral* and (2), that in science and technology lie the solutions to the world's problems. We can be sure that the Mexico meeting of the AAAS will once again serve the system very well.

*officially known as the "Alliance for Progress", the Kennedy plan of the '60s aimed at preventing more "Cuban" revolutions in Latin America.

Enter the Mexico City Meeting

In September 1971 the AAAS announced plans to hold its 1973 annual meeting in Mexico City. We will consider, in what follows, how well these plans fit into recent trends emphasizing the importance of science and technology for misdevelopment.

The AAAS is the main outlet for propaganda about how science and technology 'serve' the needs of the people, how scientists are concerned with social problems, and doing the research to resolve them. The importance of the AAAS in this regard comes in terms of its uniqueness in the U.S. among all the scientific and professional organizations, as the main purveyor of the ideology of U.S. science under capitalism. Science and technology for misdevelopment will be portrayed, at the Mexico meeting, as science and technology for human welfare. Thus as announced in an editorial in *Science*, the journal of the AAAS, the objective of the Mexico meeting

will be to present to a professional and a lay audience aspects of science that profoundly influence the development and well-being of all people in the Americas . . . The board of directors of the AAAS feels strongly that the Mexican meeting, emphasizing those activities which further the public understanding of science throughout the hemisphere, is consonant with the fundamental aims of the Association. It is to be hoped that the knowledge exchanged, when applied to human affairs, can play an important part in the future of the whole American continent. [4]

While the rhetoric is one of human welfare, the sessions and symposia are devoted to rationalizing and justifying the existing system by formulating new instruments of social control, by presenting—before the AAAS membership—government, industry, and foundation officials, and other apologists for the oppressive institutions of U.S. society, and by failing to analyze and understand the fundamental reasons for the oppression of people. Thus the AAAS does more than simply whitewash science—it actually reinforces and perpetuates the existing political system.

In 1952 the AAAS added to its stated purposes efforts "to improve the effectiveness of science in the promotion of human welfare." Finally, in 1958 a Committee on Science in the Promotion of Human Welfare (CSPHW) was set up. This committee has done nothing in its 14

years of existence but sponsor a few irrelevant symposia. In 1970, of a total expenditure of \$5 million, the AAAS reported an expenditure of zero dollars (0.00%) for Promotion of Human Welfare (or anything resembling that).

Before delving directly into the contents of the program for the Mexico City meeting, let us indicate more clearly the political position of the AAAS with respect to Latin America. The following editorial in *Science*, by the editor, Philip Abelson, leaves little doubt:

The most dynamic country in South America today is Brazil. During the past several years, its gross national product has been growing at the rate of about 9 percent; in 1971, it grew 11 percent, and talk of the "miracle of Brazil" has begun. On the average, Brazil is not nearly as advanced or as literate as Argentina. In the torrid, dry, northeast region of the country, some 30 million people live in poverty; about half of them have a yearly cash income of less than \$50. It is in the southern, more temperate region that industry is booming. Production of steel is increasing rapidly and is projected to reach 8 million tons in 1975. Brazil has begun to export motor vehicles. Last year, several million dollars' worth of precision parts for aircraft were exported to the United States.

One of the largest Brazilian efforts has been in education. Resources devoted to education have doubled during the last 5 years. During the past 8 to 10 years, the number of students receiving higher education has increased by 500 percent. The tradition of education for the few has been abandoned.

Brazilians have a flair. The great wholesale food distribution center in Sao Paulo is unsurpassed in convenience, size, and cleanliness. It makes comparable centers in the United States look anachronistic and grubby. Similarly, their huge international exhibit hall outclasses most of ours. The big shocker is the new capital, Brasilia. Its construction in the midst of nowhere has opened up a vast region. Its architecture and the city plan are highly imaginative and striking.

By reason of Brazil's geography, the present dynamism of the country could have profound consequences on the rest of South America. Brazil borders every country of the continent except Chile and Ecuador, and its neighbors are highly

MEXICO: 'A VAST MUSEUM'

A Guide to Matters of Importance in Mexico: Pesos (\$), Tourist Cards, Sights to See, Beer

AAAS Bulletin

sensitive to the changes that are occurring. To varying degrees, they are apprehensive and envious of the Portuguese-speaking giant. But they are more likely to look to Brazil as an example than to the United States. [5]

Is this the same Brazil denounced world-wide for its political persecutions and savage torture of political prisoners? the same Brazil which wages a campaign of genocide against the impoverished Indians of the Northeast? the same Brazil which hosts the disease-ridden and impoverished slums of Rio de Janeiro and Sao Paulo, among the world's worst? the same Brazil in which power and wealth are being grabbed by a small ruling elite? the same Brazil which has cleaned its universities of political freedom and imposed on them a reign of terror? What arrogance can regard as "flair" the enslavement of the Brazilian people to produce the aristocratic opulence of Brazilia? This editorial is a flagrant assault on the aspirations of the Latin American people, a statement which can only be representative of those for whom oppression of the people means the guarantee of class privilege. U.S. President Nixon, speaking on the occasion of a visit from the Brazilian President Medici, said "As Brazil goes, so goes the rest of Latin America." (As Nixon goes, so goes the AAAS).

The alliance of the AAAS with reactionary forces is not always so blatant. Often it is simply a matter of repeating the prevailing ideology. For example, in the following editorial it argues that for Latin Americans to fulfill their aspirations they must be careful not to place restrictions on foreign capital:

If the Latin American countries are to make substantial progress toward fulfillment of their aspirations, they must succeed in bringing to bear on the task much larger intellectual and other resources than have heretofore been employed.

One method is to utilize outside resources: for example, the transfer of technology through foreign investment. The CACTAL (Conference on the Application of Science and Technology to Latin American Development) report seems to restrict that avenue, for it recommends restrictions on the operations of foreign firms that those firms would be reluctant to accept.

The Latin American countries might try to utilize some of the bounteous resources of scientists and engineers in developed countries. This would require an unprecedented degree of cooperation on the part of the Latin Americans and a willingness to provide conditions that would permit effective tackling of problems. (Emphasis ours)[6]

The political position of the AAAS is clarified even further by the affiliations of the people it has selected for the Advisory Committee of the Mexico City meeting. Except for a few Association functionaries, the committee

Mexico City Meeting/AAAS ADVISORY COMMITTEE

Walter Berl

- * meeting editor, AAAS

William Bevan

- * executive director, AAAS

Harrison Brown

- * foreign secretary, National Academy of Sciences
- * member, bd. of directors, Resources for the Future [8]
- * organizer of industrial conferences on Resource Development

William T. Golden

- * chairman of the board, Federated Development Co.
- * dir. Block Drug Co, Verde Exploration (with operations in Latin America), American Investors Co., etc.
- * member, Department of State Advisory Committee on Private Enterprise in Foreign Aid, 1964-65
- * trustee, Mitre Corp. (weapons developer), Riverside Research Institute and Hudson Institute (military think tanks)
- * member, Council on Foreign Relations (see box)
- * member, Executive Committee, AAAS

Caryl Haskins

- * former member President's Scientific Advisory Committee
- * director, E.I. duPont de Nemours & Co.
- * trustee of Rand Corp. (military think tank)
- * member, bd. of directors, Population Council (see discussion of population control)
- * member, bd. of directors, Council on Foreign Relations (see box)
- * member, bd. of directors, AAAS
- * promoter of cultural and scientific imperialism (see book *The Scientific Revolution and World Politics*), and of ruling class ideology (see book *Of Societies and Men*)

Howard O. McMahon

- * president, A.D. Little, Inc. (see box on right)

*

Glenn T. Seaborg

- * former chairman, Atomic Energy Commission
- * former member, President's Scientific Advisory Committee
- * member, Council on Foreign Relations (see box)
- * president, AAAS

Athelstan Spilhaus

- * former president, AAAS
- * Scientists for Nixon

is composed almost entirely of individuals affiliated with ruling class institutions, the government, and corporate enterprise (see above). In some cases they even have direct interests in investment in Latin America.

The Meeting

We have now set the stage for discussing the AAAS Mexico meeting. Seen in the context of the role played by science and technology in Latin America, this meeting is not simply an innocent gathering of scientists. Rather, it is meant to be an important instrument for the extension of U.S. science and technology into Latin America, in the service of U.S. imperial interests. The AAAS Advisory Committee, itself representing such interests, has

prepared a program well geared to meeting the needs of U.S. capital investment, while ignoring the often-expressed needs of the Latin American people.

Official host of the meeting and working with the AAAS in the planning is Mexico's National Council of Science and Technology (CONACYT), a recently formed committee of the Mexican Government which has broad coordinating responsibilities in scientific and technological affairs. It would be a mistake to suppose that this committee, or the Mexican Government for that matter, represents the interests of the Mexican people, any more than the AAAS or the U.S. Government serves the American people. It is merely part of the Latin American oligarchy allied with U.S. economic power, which has adopted capitalist forms of *misdevelopment* for Mexico. Since 1940, for example, the Mexican government has opened the doors to U.S. investment, and has used its police and military power to maintain social stability, most notably in the case of the 1968 massacre in which several hundred political demonstrators were slaughtered just prior to the 1968 Olympic games.

The Mexico meeting has ten central themes, roughly divided into two categories: those directly concerned with science and technology for misdevelopment, and those concerned with the infrastructure of social and ideological control required for popular acceptance of exploitation. What can we expect the focus for each of these themes to be?

The themes in the first category all have an underlying misdevelopment scheme: "The Sea and Its Resources"—to promote Latin American cooperation with U.S. plans to extract the internationally-owned wealth of the sea; "Deserts and Arid Lands"—to explore irrigation and other schemes for making these regions produce for U.S. capital (as with wheat and cotton in Mexico); "Nutrition and New Food Technology"—to further develop agribusiness in Latin America, especially through Green Revolution technology (never mind food for the hungry); "Non-Nuclear Energy for Development"—to explore new ideas in the development of oil resources and off-shore drilling for private interests; and "Earth Sciences for Development"—to emphasize the need for long-range U.S. planning of its consumption of Latin American resources.

The other category, oriented toward social control, is more subtle in nature, more ideological in content. For example, "Science, Development, and Human Values" will try to assess the impacts of U.S. investment on Latin American society in order to rationalize further investment—rather than to question the basic nature of the capitalist development scheme. "Problems of Population" is to obscure the nature of the social and political system and the oppression it engenders by focusing on population growth as the key problem of Latin America. "Opportunities in Education" is to help develop a technical support structure needed for U.S. *misdevelopment* schemes. "Ecology and the Deterioration of the Environment" is to cloud the political issues by focussing on the nature of air and garbage in the urban centers in Latin America without discussing either the conscious exportation of pollution from the U.S. or the reasons for the poverty and privation

COUNCIL ON FOREIGN RELATIONS (CFR)

The CFR is the group of 1450 men (women are barred from membership according to its by-laws) who formulate "U.S. government" foreign policy. Established in 1919 by the Dulles brothers, J.P. Morgan, Averell Harriman, and John D. Rockefeller I, it is to this day comprised mostly of corporate and finance magnates. Other members include figures like university presidents (Harvard, Yale, etc.), academics, senators, and foundation representatives, who are not directly involved in corporate or finance affairs, but who avail their services to CFR (i.e. ruling class) interests. Funds come from the Rockefeller and Carnegie foundations along with dues of member corporations which each pay from \$1,000 to \$10,000 yearly. The group conducts about 100 meetings per year, in addition to sponsoring long-term study and discussion groups, for the purpose of planning and executing policies which maintain and extend the power of U.S. private investment interests around the world.

In its 50-odd years of existence the CFR has often been represented in Government in extremely influential positions. Eisenhower and Kennedy were CFR members while serving as President. Nixon is also a member. Dean Rusk, the Bundy brothers, Henry Kissinger, Ellsworth Bunker, John D. Rockefeller III, and Henry Cabot Lodge are all members. Present CFR posts in government include Assistant to the President for National Security, Secretary of the Army, Director of Public Broadcasting, Chairman of the Federal Reserve System, Ambassador to South Vietnam, Chairman of the National Commission on Population Growth and the American Future, Chairman of the President's Foreign Intelligence Advisory Board, Ambassador to the U.N., and Chairman of the Atomic Energy Commission.

There are now at least 110 CFR members who are holding or have held key policy-making posts in the Nixon Administration.

Arthur D. Little, Inc.

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At recent seminars held by Arthur D. Little, Inc., in New York City, Chicago, and Los Angeles, members of our Mexico City staff discussed the political and economic climate for investment opportunities in Mexico. This report is based on their comments.

ADL has been concerned with developments in Mexico for over 50 years. For example, investigations of energy resources in the Western Hemisphere, begun by Dr. Little in 1916, led to a study of Mexican Petroleum resources. Since then we have performed many studies for agencies of the Mexican Government and for private interests in Mexico, the United States and various foreign countries. ADL has conducted many studies of investment opportunities in Mexico for U.S. investors and has assisted in implementing investment programs. We have recently completed a study "Current Mexican Attitudes Toward Foreign Investment."

Mexico continues to present interesting opportunities for investment. The Gross National Product of Mexico is expected to grow from \$21 billion in 1966 to \$27 billion in 1970, for an average annual increase of 6.5%; it has political stability; it has hard currency; it has no restraints on the outflow of profit. Further, the Mexican Government, while intent on protecting what it considers its legitimate national interests, is prepared to negotiate to encourage foreign investors that contribute to national economic development. The Mexican Government is especially interested in attracting foreign investment in areas which demand a high degree of technology or involve a certain amount of risk.

We hope you will find this report of interest.

Sincerely,


Vice President
Management Services Division

of those who live in the squalor of urban slums. In all these cases the existing political and economic relations are not challenged. Science and technology are portrayed as politically neutral instruments of growth and "development". Acceptance of the U.S.'s anti-human forms of development, and perpetuating them under the guise of scientific neutrality, is the destructive use of science as cultural imperialism.

These comments on the Mexico meeting are not merely conjecture. The past history of the AAAS, the affiliations of the AAAS Advisory Committee, the way in which this meeting has been planned and organized all ensure that there will be no meaningful approach to the every-day problems that plague the Latin American people.

The meeting program thus constitutes a broad survey of "problems" of imperialist development, but this is not to say that many of the topics would not have a legitimate place at a conference where the interests of working people were primary. Clearly nutrition, resource development or earthquake prediction are relevant and important when the emphasis is right. For example, if earthquake study results in better housing for the "masses" and improved zoning in the development of cities, from the viewpoint of the urban majority, then the topic is legitimate. If, however, it means the zoning of safer neighborhoods for the rich, less vulnerable Holiday Inns and high rise luxury apartment buildings, then this is the technology of imperialism.

The evidence we've seen indicates that the AAAS and CONACYT have engineered the program so as to insure that those who represent the scientific elite, government agencies, industry, and private foundations will dominate the meeting. As usual, the AAAS issued no call for papers or proposals for this meeting, but rather selected various groups and individuals to participate. The program makes pretty clear who was on the AAAS' list—representatives from the Ford Foundation, the U.S. Department of Agriculture, A.D. Little Co., Harvard Business School, the World Bank, and even Coca Cola. In Mexico, as well, the scientific, educational, and governmental elite were chosen as organizers for the various symposia. They in turn, have organized symposia meant to further their own positions and established interests—the unrestricted growth of the present forms of science and technology.

By restricting the meeting in this way to only the established elite, the AAAS and CONACYT have insured that younger American scientists, especially those who are critical, will have almost no opportunity to participate. Those who have expressed opposition to the present forms of scientific and economic development have been essentially excluded from the meeting. A noteworthy example is the group of Third World scientists who participated in the December 1971 Philadelphia AAAS meeting and who as a result issued a strong anti-imperialist statement. Those participating in that group, including about 20 Latin American scientists, have not been invited back to the Mexico meeting. Furthermore, while it is claimed that half the participants will be from Latin America, to date



there are no Cubans involved. The Mexico meeting is meant to be a gathering of those who have benefitted from the present system and who seek to perpetuate it.

The political motive and impact of the meeting can be seen more clearly by considering the two most sensitive areas of the program: the parts on technological development and population control. In both cases the U.S. program arrangers are drawn from the foreign office of the U.S. National Academy of Sciences (NAS). Harrison Brown, co-arranger of the theme on Science, Development and Human Values, is the foreign secretary of the NAS; and Roger Revelle, co-arranger of the theme on Population Control, is the past chairman of the NAS Board on Science and Technology for International Development. Funded almost entirely by U.S. AID, the foreign office of the NAS and this Board in particular carry out studies and programs connected with AID's goals (as explained in *Por Que*) of promoting U.S. economic interests in the Third World.

The nature of the foreign office of the NAS is revealed by the four individuals who dominate it—Brown, Revelle, Carl Djerassi, and Bruce Old. Brown has been the NAS foreign secretary for over ten years and has been an advocate of population control and industrial resource development planning for U.S. capital (see *Por Que*, p. 26). Revelle, currently chairman of the Ad Hoc Advisory Committee on the Role of Science and Technology in International Development in the 1970's, is also head of the Harvard Center for Population Studies, funded by the Ford Foundation, and has recently chaired an extensive AID-funded NAS study on Third World population control. Djerassi, presently chairman of the Board on Science and Technology for International Development, and a Director of the Syntex Corporation, is an ardent advocate of capitalist expansion in Latin America (Syntex manufactures pharmaceuticals, including birth control pills, in Latin America, and has conducted abusive birth control experiments on Mexican-American women). Djerassi is also chairman of the NAS-Brazil bilateral chemistry project (instituted on behalf of the right wing Brazilian government). Old is interested in technology transfer activities; he is foreign secretary of the National Academy of Engineering (NAE) and currently senior vice president of

A.D. Little Co., which has extensive interest in Third World capitalist development schemes (see *Por Que*, p. 26). These are the individuals who oversee the activities of the NAS foreign office and who cooperate with AID to aid in the exploitation of the Third World.

Their political perspective is strongly reflected in the Mexico meeting. The population control theme (arranged by Revelle) is a good case in point. According to Walter Berl, U.S. meeting editor, the Mexican planners were originally opposed to making population control a major theme of the Mexico meeting. But the U.S. put on the pressure, and CONACYT finally capitulated (Revelle is president-elect of the AAAS). Revelle, it should be remembered, recently chaired the NAS study, *Rapid Population Growth: Consequences and Policy Implications*. The report, naturally enough stresses the importance of population control in Latin America and emphasizes the need for capitalist development programs.* That the U.S. should consider the population control theme an essential part of the Mexico meeting is not surprising, in view of the large scale AID and Rockefeller Foundation birth control programs in Latin America (the latter is providing financial support for the Mexico meeting). Included also in the Mexico meeting will be a three and one half day symposium on family planning being arranged by a representative of the Federacion Internacional de Planificacion Familiar (International Planned Parenthood) and which is described in a AAAS working document as follows:

The purpose of this symposium is to promote family planning in Mexico and Latin America. The anticipated problems that will arise from this relatively new socio-medical concept will be examined and discussed. There will be an exhibit and panel discussions of interest to the general public. The greater portion of the program will be of a high technical level, and will be particularly directed towards doctors, social scientists, biologists, and students of these disciplines. [7]

As we described in *Por Que*, these are the types of conferences used to sell to Latin American people the idea that their growing numbers is their main problem—not the maldistribution of resources, wealth, and power.

To analyze in detail every symposium in the Mexico meeting would be a very large undertaking—there are ten central themes and some 29 or so other sessions. But in view of the heavy control exercised in planning the meeting, it would be surprising if the other symposia took political positions far different from those quite obvious in the case of population control. In addition, we are struck by the conspicuous absence of sessions of obvious importance. For example, where are the sessions on military and counterinsurgency technology, on the problems of brain-drain and underutilization of talent in Latin America, on the domination of U.S. science in all the laboratories and classrooms of Latin America, on the diverse

* The report is being translated into Spanish by the NAS!

forms of cultural imperialism perpetuated by U.S. science and technology, on the question of housing and urban slums and the quality of life engendered by these environmental conditions, on finding a form of cooperation between scientists in the U.S. and Latin America which is non-exploitative and free of U.S. domination? Such sessions are nowhere to be found.

The Mexico meeting will not deal meaningfully with the difficult problems facing the people of Latin America with respect to the proper use of science and technology. Rather this meeting will be a continuation of the existing scientific and technological relationships between the advanced capitalist countries, notably the U.S., and the Third World. All the evidence we've seen suggests that the meeting will be an opportunity for the scientific jet-set of both the U.S. and Latin America to perpetuate the uncritical and mechanical way in which they serve the cause of U.S. economic and cultural expansion into Latin America. Thus the Mexico meeting is part of an attempt to advance yet one more stage in the conquest of Latin America. In the past, new conquerors invoking new gods and bearing trinkets landed on Latin American soil to plunder these lands. Now we see a new breed, with a new god, this time bearing pills and seeds and lightning in their grasp.

That the imperialistic nature of the Mexico meeting will not be missed by people in Latin America is understood by CONACYT and the AAAS. Will dissent be stifled in Mexico as it was recently in Washington when the AAAS arrested eight people for distributing literature critical of established science and the system it serves? While students and others will be allowed into the Mexico meeting (\$2 charge for students, \$25 for everyone else), it is the "opinion" of Walter Berl (U.S. meeting editor and chairman) that literature will have to remain outside. This would mean that critiques or other written expressions of opposition will be stifled. If the AAAS and CONACYT were serious about the desire to deal with important issues rather than simply propagandise, how could they justify such a repressive posture? Hopefully some of their propaganda can be counteracted and a far-reaching alliance of scientists can be formed to aid in the struggle for liberation of the people of the Americas.

AAAS/Mexico City Project

NOTES

- [1] Tom Weisskopf, *The Harvard Independent*, Nov. 1969, quoted in *The Cambridge Project—Social Science for Social Control*, Judy Kauffman et al., eds., Cambridge, 1969.
- [2] Quoted in *Action Latin America*, vol. 1, no. 2, January 1972.
- [3] *MIT Tech Talk*, Nov. 8, 1972, p. 18.
- [4] *Science*, vol. 174, no. 4009, Nov. 5, 1971, p. 549.
- [5] *Science*, vol. 176, no. 4039, Jun. 9, 1972, p. 1077.
- [6] *Science*, vol. 178, no. 4056, Oct. 6, 1972, p. 13.
- [7] from AAAS working document dated Dec. 15, 1972, p. 11.
- [8] Resources for the Future is a "non-profit" corporation funded as a joint endeavor by the Ford and Rockefeller Foundations, and is engaged in research and planning for resource "development", land management, pollution control and other related areas. RFF has a special Latin American Program which has produced a detailed study of Natural Resources in Latin America, studies of agricultural productivity, etc. In 1970, RFF worked jointly with the Rand Corporation on Middle East Studies and the World Bank on misdeveloping the Lower Mekong River.

Relatives of the Heroes who fell on March 13;
Guests;
Students;
Workers;

This historic date on which we meet at the University has always been a basic topic of our meetings. This year we want to discuss a topic which by no means can be considered unimportant on this March 13: we want to speak of the University.

We all thought we had some more or less clear ideas on what a university should be in a revolutionary process. Actually, we all had more or less vague ideas. We spoke of a university reform as we spoke of an agrarian reform.

The agrarian revolution which is taking place in our country has practically nothing to do with our first underdeveloped ideas of what an agrarian revolution should be, a revolution which we described as a "reform" when we did not even understand that no reform, but only far-reaching revolutionary changes, could solve the land problem.

Exactly the same thing happened with the University. It could not have been otherwise, because our ideas of the first days included concepts formed in the society in which we lived at that time, a society in which it became a legitimate and important aspiration of our people to put into effect a series of measures and changes which, within the framework of that society, were practically impossible.

We must state that this transformation of our ideas about the University took quite a while. It must be said that, throughout the revolutionary process, we were always able to count on the enthusiastic participation of the students. On the question of attitudes, ideas and political positions, we can proudly proclaim today that, without a doubt, the students of our universities are in the vanguard of the revolutionary process.

However, in this case a vanguard position cannot be limited to the field of politics. It should also be a vanguard position in the fields of technology and science; it should be a vanguard position along the road which someday all of society will have to take.

As all of you know, all ideas, new ideas, make an impact; all new ideas always create a shock. New ideas are not always easy to understand. Thus, when some reference has been made to the fact that someday the university will become universal and that when the university becomes universal it will cease to be a university, these words—which are not a play on words, a riddle or anything of that nature—express an idea, an idea which is not easily accepted by everyone from the very beginning, since not everyone understands, not everyone can understand how university education can become universal and how an entire nation can study someday at university levels.

In part, this derives from the whole concept and idea of things we have from what we have always known; it derives from the old ideas of the old society, in which knowledge and the mastery of technology and science were the privilege of an insignificant minority. No one knows how many vices and habits are caused by the circumstances that knowledge is the patrimony of a minority.

However, it is hard to reconcile the idea of a revolution with the idea that in the future there should always be a minority in society with a monopoly on



technical and scientific knowledge and a majority shut out from this knowledge.

In the first place, there is no provision for how problems can be solved in the future if such knowledge is not made universal; in the second place, *there is not the slightest hint of how communist society can become a reality if scientific and technical knowledge is not made universal*. Some people believe that it will always be necessary for some sections of society to be doing the hard work; some people believe that there will always be one group of men doing intellectual work and nothing but intellectual work while other groups of men are doing the hard work and nothing but the hard work.

This work, which takes long and endless hours; this work, which demands great effort — physical effort, an animal-like effort exacted of man — the old form of work, the work which practically developed man, the work which raised him from his primitive condition as his efforts were increasingly directed by his intelligence — when this work is completely ordered by man's intelligence, completely controlled by man's intelligence, it ceases to be hard, animal-like work.

It is, therefore, impossible for us to conceive of the development of the people's education without including in our conception of such a process the devel-

opment of every potential intellectual intelligence of that people.

The contradiction between work being resolved to the same level as study. Work is being done today in the junior high schools and the universities. However, under these conditions permit. This, without any contradiction; the technicians versus the fundamentalists or four-month periods to pass. There is a reason for this. In the past, those who were in the ladder, society's most advanced, the cane cutters, who not only did the jobs during the sugar harvest but also the scourge of the "dead seasons," and had to live under these conditions. This category does not exist any more in society!

It is impossible to conceive of such work falls forever on the same section. It is quite logical — among them students,



everybody — are participating, in ever-increasing numbers in the work of the sugar harvest.

Next year the University will have a great job to do in the 1970 sugar harvest. During the 10-million-ton sugar harvest, technology students will go to work in the province of Camaguey, there to give technical backing in the cane-conditioning centers and sugar mills.

In our opinion, the country will benefit greatly. It will benefit from the infusion of intelligence into the activities involved in the economic development of the country, but it will also benefit from the high quality of technicians to be graduated from our universities aided by this type of activity.

Thus, these first experiments in moving universities from their traditional seats, which converts a mountain-work project into a university class-room and the physical planning room of an agricultural administrative office unit into an Architecture School classroom, are examples showing how it will be possible to gradually create university classrooms in all work centers as more and more instructors and more highly qualified personnel become available in these centers.

These examples reflect the process through which the present university system will gradually disappear, to be converted into a method of teaching that will be employed in every work center. There will come a day when we will fully realize, for example, that the ultra-modern nitrogen plant now under construction in Cienfuegos is the best place for the training of technicians specializing in that type of work, the production of fertilizers. This country already has the latest-type electric-power plants, and very modern plants for the production of fertilizers are now under construction. Thus, our developed industry will become the future university. That is where the intermediate-level technicians will go to work and where they will find their university.

This process will lead to a day when every farm, sugar-cane-growing program, cattle-raising ranch and forestry development program will become a sort of school of agronomy where all those working there will be given advanced-education courses. Once compulsory universal education through the senior high school level is in effect, entire generations with that level of education will go into productive work, and entire generations will be given an advanced education at their work centers. If we want hundreds of thousands to study, we cannot have them study in universities.

The old idea of the classic university will disappear as such. The concept of the university will disappear, as befits an institution that belongs to a society far back in the past.

Thus, production itself, productive activities and productive processes will constitute the material base, the laboratory where all the workers will be given an advanced education.

This is the way we see, the way we understand, the development of institutions of higher learning in the process of our Revolution. And let us not overlook the fact that the advance of our Revolution can be measured only this way. It will not be measured by the growth of our agriculture — which will indeed be great — or by the year-by-year growth of our industrial production.

The levels of development that this country will reach may be measured only by the percentage of young people carrying on advanced studies. It will be measured by the total number of citizens carrying on such studies.

These ideas I have mentioned, these ideas which represent the *essence of Marxist thought*—the combination of work and study, the *combination of intellectual work and manual work*—are not mere slogans. They are ideas which represent the essence of the society of the future. They are the premises on which the idea that knowledge must be universal, must include university training, is based.

All the universities must aim at development in all fields—in some more than in others. Many of the problems that we have today are the result of poverty.

But the *buildings and the equipment are not the most important factors; the most important factor is man.*

Since we've brought up this problem, I want to point out a defect that is very characteristic of technicians, scientists and research workers in capitalist society. If anybody's ears are burning he can always fall back on the thought that we're talking about capitalist society.

There's a defect, almost a vice, that comes from that society and which goes with those activities that used to be carried on by minorities. When a society is such that there's only one person with know-how in a small town, just one doctor, just one engineer, just one individual who possesses certain knowledge, that individual enjoys a position of moral, social and economic privilege. And logically that situation engendered a pattern of professional jealousy, pride and vanity; feelings of superiority towards others, of being unique among the many.

It must be said that it will, unfortunately, be necessary to fight for some time so that the most important, most essential prime virtue for a technician or a scientist will prevail. And that virtue is modesty, modesty! Always bear that in mind: modesty!

How many interpersonal relations become poisoned, how much cooperation is prevented, how much gossip and how many contradictions can be traced to the fact that man has still not been able to fully overcome the primitivism he bears within himself, the egoistical mentality, the individualism, the feeling of superiority toward others. What a struggle has to be waged to overcome these factors, even in language; to inculcate in people the idea that the important thing is what is made and done, the content of what is done, regardless of whether our merits are recognized or not, regardless of whether the source of an idea or a piece of research is recognized or not.

And if everybody comes to possess knowledge, it will be necessary to learn to live in a spirit of modesty, to learn to think and work and act in a modest way, with no feelings of superiority toward others.

If there is one thing that must be promoted, if there is one thing that must be advanced as part of the formation of our future generations of technicians, it is the struggle against immodesty, vanity and individualism. And we will always assess a scientist over and above everything else, not for his/her knowledge but for the degree of humility and modesty with which he/she is able to contribute knowledge to the human race. Experience has taught us that this is very important.

These are some ideas on present conceptions of universities and how we view a university revolution.

Agriculture in China

AN EYEWITNESS
REPORT

Ten SESPA members visited the People's Republic of China in February and March as guests of the Chinese Scientific and Technical Association. Their four weeks were a very brief introduction to the practice of science under socialism. The possibility of the trip was first discussed in Boston in January, 1972. Collectives for preparation and study — including SESPA people who didn't intend to go — were formed in Boston and in Stonybrook, New York. The delegation was chosen through discussion within the group that responded to a call in the May 1972 issue of Science for the People, on the basis of a balance of qualifications, with political practice and outreach possibilities as dominant factors. The participants are anxious to share their experiences and to speak to SESPA or other groups. They can be contacted through SESPA in Boston.

Their itinerary included universities and other educational institutions, research institutes, health care facilities and productive units such as factories and communes. One of the most important themes in what the SESPA China Collective saw was how Chinese scientists, technical workers and other intellectuals strive to learn to "serve the people wholeheartedly."

The section below describes the application of technology in the agricultural field. It is excerpted from a forthcoming book by the members of the SESPA China Collective, entitled People's Science in China.

Throughout the Chinese Revolution, both before and after the victory of 1949, conflicting strategies for consolidating socialism in the countryside, and thus planning rural development, have generated fierce struggles within the Chinese Communist Party. The struggles within the party have in turn reflected underlying social developments in the countryside and in the cities. Particularly since 1949, scientific and technical developments and the uses to which they are or could be put in agriculture have played a key role in these struggles.

The success of people in the less developed countries in achieving development in their interest depends in part on their being able to obtain unity between urban and rural workers. China is a classic example of the success of this strategy. But the differences that have developed between town and countryside don't disappear with the victory of the revolution. The Chinese are determined to unite the countryside and cities in joint parallel development. To do this they must work hard to counter the spontaneous tendency for industry and wealth to concentrate in the large cities. This is where rural light industry comes in. By encouraging communes and counties to set up small factories, the Chinese are providing the industrial base for the mechanization of agriculture and at the same time countering the dependence of the countryside on the cities. The cities can concentrate on heavy industry requiring large capital investment and the country people meanwhile begin to experience and master the machinery and techniques of modern industry. The Chinese believe that through large scale mechanization the peasants will become agricultural workers, in the same sense that steel workers are workers. As Liu Hsi-yao put it during our Great Hall interview: "In terms of technology there is no line of demarcation between agriculture and industry."

To set the context for our investigation of the Xigou scientific and technical effort in agriculture, a few initial social and physical facts follow. Xigou People's Commune has 5,000 members divided into 10 production brigades. Xigou Production Brigade is part of Xigou People's Commune and has 1,680 members (380 households) divided into 12 production teams and scattered among 44 small villages. The brigade occupies several small and large valleys, lies about 1,500 meters above sea level, and enjoys about 150 frost-free days a year. Though Xigou is not a "rich" brigade, it is unusually "advanced" in some respects. Private plots are a case in point. In most places in China households are allotted a certain amount of land for private pursuits. The size of these plots and the emphasis put on them has been a subject of controversy within the Communist Party, but all seem to agree that they are necessary in most places during the period of socialist transition. Xigou, we were surprised to discover, has no private plots. The people there, we were told, find it more profitable as individuals to till all the land collectively. With this background in mind, we can discuss our interview with the Xigou Production Brigade Scientific and Technical Group. Five of the Group's members participated in this meeting, including several technicians, an older "experienced" peasant, and a forestry team member. The person responsible for Brigade agricultural output, Kuo Gang-zhu (vice-chairman of the Brigade revolutionary committee) led off the discussion by saying, simply, "We've done some scientific research work." And then he defined the principles that guide the group's approach: "Science and technology must serve production and serve the people under

the leadership of the Communist Party and Chairman Mao." To illustrate this idea Kuo ran down the history of grain production at Xigou.

Before liberation (1937 in Xigou, which was on the border of the communist held territories during the war against Japan) people grew only about 100 jin of grain per mu. In 1943 some peasants established mutual aid teams in which they helped each other in the fields on a coordinated basis. Grain production rose to about 200 jin per mu. In 1951 mutual aid team members pooled their land and farming implements to form producer's cooperatives. The cooperatives' yearly incomes were distributed on the basis of a household's original contributions of land and implements as well as on amounts of work performed. These cooperatives raised production to 300 jin of grain per mu per year. In 1955 the Xigou cooperatives adopted the principle of distributing yearly income entirely on the basis of work performed. The resulting "advanced cooperatives" achieved a grain output of 400 jin per mu per year. In 1958 the advanced cooperatives around the Xigou area merged to form a people's commune, making possible larger scale water conservancy efforts, and production rose to more than 600 jin per mu per year. By 1969, after the Cultural Revolution, yield had increased to more than 800 jin per mu and in 1970-1971-1972 it averaged more than 1,000 jin per mu, an increase of 10-fold over pre-revolutionary production.

In each of these periods of increased production, social change preceeded and fostered technical advance. Kuo explained that the only way to "improve our scientific research work and make scientific research work serve production is to mobilize and encourage all members of our brigade to take part in scientific research work. It is the only way we can learn about nature in a better and faster way."

Kuo went on to outline the agricultural effort at Xigou in terms of the "Eight Point Charter" of agriculture put forward by Mao in 1958. In the following paragraphs, we will present Xigou from the vantage of some of the eight points:

Soil Improvement (T'u). Xigou Brigade occupies an area about 7½ kilometers long and 4 kilometers wide. It is all exceedingly hilly. Most of the crops are grown in small terraced fields held in place by rock walls cut into the hillsides or extending up ravines. Xigou gets only 50 centimeters of rain a year, half of which falls in July and August. There is a prolonged drought from mid-winter through spring. In the past when the summer rains finally hit the parched hills the water ran off quickly, rushing in torrents down the mountain ravines to carry away the soil and crops in the terraced fields along the way.

In this circumstance, Kuo said, "The major task is to hold the water in the soil." The Xigou people have accordingly developed several farsighted projects which mesh together for one purpose—hold on to the water, hold on to the soil.

Dung U-gou Valley, longest of the seven major valleys encompassed by the brigade, may serve as an exam-



ple of this effort. The valley is 4½ kilometers long and is worked by 32 households scattered in 14 small villages. Since liberation the people of the valley have built 130 dams and terraces and created 30 mu of cropland where no soil at all existed before. On the hillsides above the valley they have forested 300 mu of land.

We drove up Dung Ui-gou valley one afternoon to look at the terracing work. In the part of the valley we examined closely, a rather narrow gulch that had obviously at one time been a deeply eroded and worthless gulch had been transformed into a neatly laid out staircase of small fields. A narrow rock terrace wall separated each level from the next and after every third or fourth field this wall was about a yard thick and strongly built to withstand the worst of the summer floods. These fields had all been created by hauling in soil from nearby excavations. Xigou has an abundance of loess soil, a very fine-grained yellowish wind-deposited soil that occurs in very thick deposits in the hills of northern China. (Traditionally the Xigou peasants lived in caves carved in cliffs of this soil.) Easily dug and useful for agriculture, it makes Xigou's tremendous landfill efforts possible.

These landfill efforts are most impressive on the floor of the main Xigou brigade valley. In the past this valley contained only a rock and boulder strewn riverbed and a road of poor quality. Come the summer rains, the river flooded. By spring it ran dry, and nothing useful grew in the valley bottom. In 1953 the Xigou people built a large reservoir (to be discussed in the next section) and cordoned off the river course below between closely set strong rock walls. On either side of these walls they have now terraced and filled in 500,000 cubic meters of earth, turning most of the valley floor into fields and orchards. In the past, before reforestation and the other water control efforts, it was impossible for one strong person to turn even two mu of riverside land into cultivated fields. It still takes one person three months to terrace and fill one mu of land one meter deep with soil. Xigou has begun to mechanize its landfill operations. While we were there the brigade had three small bulldozers leveling loess hills into a large field; one of these machines they owned, the other two were on loan from the county.

Rational Application of Fertilizer (Fei). Walking around at Xigou we noticed piles of blackish earthlike material set at intervals in the bare plowed fields. These turned out to be piles of fertilizing material, vital for replenishing and boosting the nitrogen contents of the soil. Most of Xigou's fertilizer comes from human and animal sources in the form of nightsoil and manure. Nightsoil is China's traditional fertilizer and has maintained the fertility of Chinese fields in the face of hundreds of years of continuous cultivation. Since the revolution the use of manure has increased dramatically with the rapid growth of animal husbandry. In 1952, at the beginning of the cooperative period, there were only 300 sheep and goats at Xigou; now the brigade's flock has grown to 1300. In the same period pigs have increased 9-fold and now number 300. The brigade also has more than 150 head of cattle and more than 190 donkeys. The Xigou people carefully conserve the manure of all these animals. On one hillside we saw a special cornstalk enclosure where the flocks are gathered together to defecate in one place. The increase in fertilizer is the single most important factor in the increase in yields over the years. For Chinese peasants the trek to the fields each year with shoulder pole buckets of accumulated manure is as much a part of life as plowing and seeding. However there is nothing indigenously Chinese about the uninhibited handling of manure. A former student from the port city of Tientsin, balked when first confronted with the task of carrying goat manure, because she thought the manure was just too dirty to handle. But, she told us, she went through a mental struggle and finally "realized that this was a petty-bourgeois idea."

In addition to nightsoil and manure Xigou brigade uses some "vegetable fertilizer" like sorghum straw and buys a little manufactured fertilizer from the government. It also maintains a very remarkable "local fertilizer" factory as an annex to the local school.

This factory makes "5406 powder," a bacterial product that is mixed with soil and applied to fields as fertilizer. In addition to its function as fertilizer, the mix-

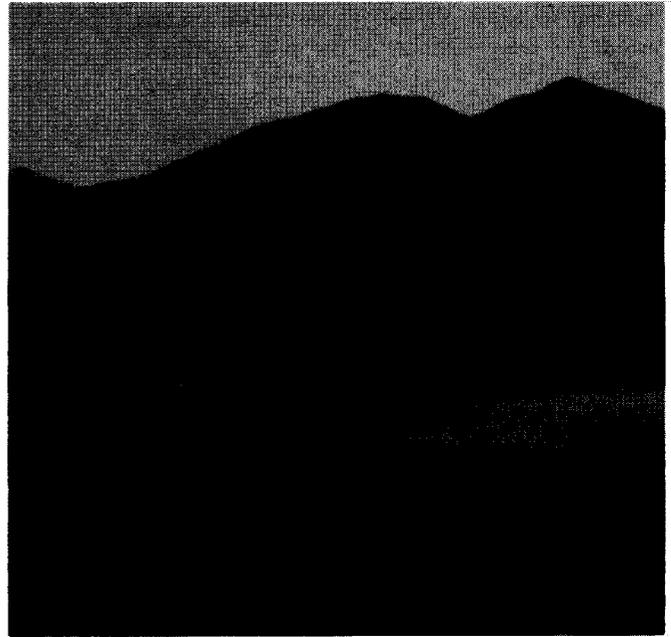
ture is reported to help crops absorb nitrogen, protect them against more than 32 bacterial diseases, and promote speedier seed germination and a shorter growing period. To make the powder the factory technicians (it appeared there were three) prepare a medium which includes potatoes, sugar, bran and agar. Live bacteria are smeared on this medium, grown for several days in a warm room and then the bacteria are collected, dried, and mixed with earth, 1:12, to make the final product.

It appears that small factories producing microbial products are now common in the Chinese countryside. We asked about the history of the project at Xigou and found that the school originally took on the project as part of a larger effort to make scientific education serve production. They first heard of the process when the Southeast Shansi District had a meeting at which someone from the Changchih school spoke about making bacterial fertilizer. To learn the process they sent two people to Changchih (which is the largest city in southeast Shansi) to attend lectures and practice techniques for four or five days. Since mastering the art, Xigou has in turn taught bacterial fertilizer making to people from about 20 other communes. Similar processes of face to face contact and exchange appear to be exceedingly important in the transmission and popularization of science in China.

Building Water Conservancy Works (*Shui*). Two large dams and reservoirs are the keys to Xigou's water conservation and flood control program. The first of these reservoirs lies above the reclaimed valley bottom land we mentioned earlier and was built in 1958 during the Great Leap Forward period of commune formation. During this period the commune "paid great attention to the local militia" as a collective force for socialist construction. The militia themselves designed and built the dam which is earth covered with stone and is 100 meters thick at the base. They completed it in less than a year by day and night work. Written in stones on the face of the dam is the inscription "Militia Fighting Reservoir." The reservoir itself has a capacity of 1,700,000 cubic meters of water.

The second reservoir stands further up the main valley and represents an even greater human effort. It is known as "Xigou Prepare-for-War Reservoir." Inspiration for its construction came from the county (Ping Hsun) after serious water shortages and a bad drought in the 1960's forced the area to import water. After the county decided the project should be undertaken the work of building fell to Xigou Brigade itself, the main beneficiaries. They had help with the design from the county department of hydraulics, and commune militia pitched in to help with part of the work, but the brigade did most of the work and footed the bill.

The dam is solid stone (33,136 cubic meters worth) and measures 178 meters long by 25 meters high. The entire dam was built without heavy machinery. A gravity powered cable operation brought stone down from mountainside quarries. The reservoir has a 615,500 cubic meter capacity and receives most of its water from the rainy season runoff. It has solved the problem of year round drinking water for 10,000 people and 5,000 animals. In addition



Xigou Prepare-for-War Dam

tion to Xigou it serves three other communes, eight production brigades, and a few small factories. It also is the focus of Xigou's irrigation program. Below the dam three canals (with a total length of 12.5 kilometers) branch out to deliver water along the hillsides of the valleys below. In about a year, when side canals from the three trunk lines are completed, Xigou will be able to irrigate 1,000 mu of land or two-thirds of its cultivated area. In concert with other improvements, this is projected to lead to yields of 1,500 jin of grain per mu by 1975, an increase of almost 50% over present levels. The reservoir itself now contributes fish to the brigade food supply. It was stocked by the district fish hatchery in Changchih and people fish with nets to haul in 4-5 pound carp in an area which never had fish before.

The Xigou people also depend to some extent on wells and ground water, a source of water which has also increased in capacity as the reservoirs raise the local water table. Finally, they see each other and every field as a small reservoir during the rainy season. Following the slogan "keep the water in the dish" they build the edges of each terraced field a little higher than the center so that it slows down and retains the water passing through.

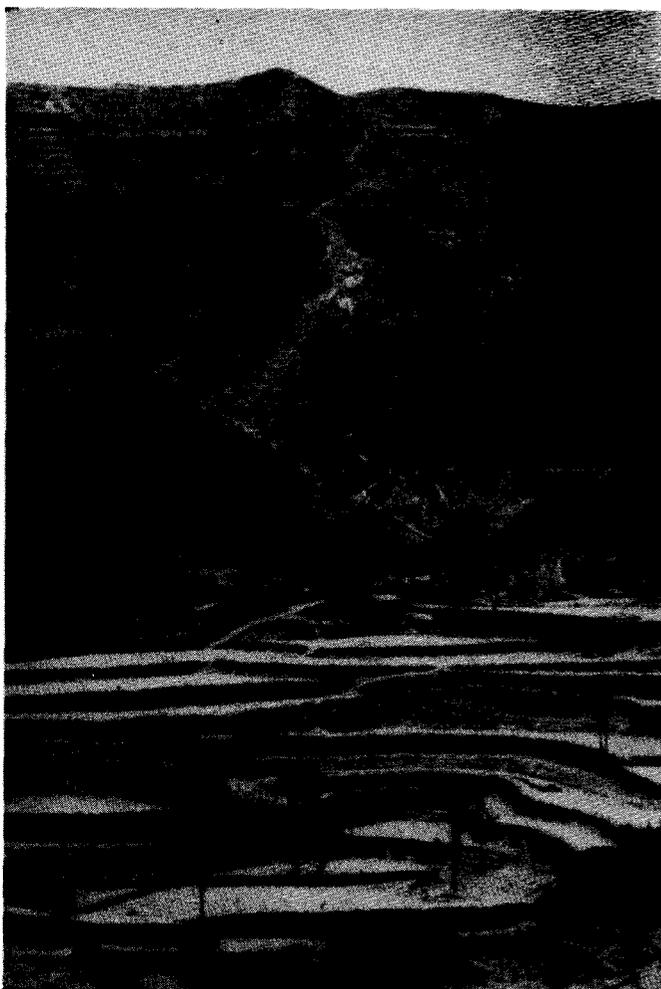
Popularization of Good Varieties (*Chung*). The introduction and development of new crop varieties has formed a major part of Xigou Brigade's scientific agricultural effort. Traditionally, Xigou relied for its maize on two local varieties which yielded poorly. Since the mid-sixties the brigade has experimented with a new technique of producing hybrid corn which involves crossing two "pure line" varieties to produce seeds that grow into plants bearing genes from each parental variety. The result is often

a much higher yield. Each year the same cross must be repeated to get seeds for the next year. Such a complex breeding system requires effort and planning that would be impossible in a peasant economy without the collective system of the communes, brigades, and work teams.

Since 1958 Xigou Brigade's self-produced hybrid corn has yielded a harvest equal to that of the more temperate climate and fertile soil of the lower Yangtze River area.

Rational Close Planting (Mi). For some time in China, close planting, the practice of sowing seeds densely, has been a subject of much debate. As the cooperatives and communes began to transform miserably poor farmland into productive land the peasants still tended to sow the low densities of seed appropriate to sparse growth under the old conditions. The new fields, with more water, more fertilizer, and higher producing varieties could support much denser stands of plants, and it became important to adopt new seeding densities to achieve the highest possible yields.

There are however limits to close planting as a technique for increasing yield. Under the old conditions dens-



Terraced Fields in the Snow at Xigou

er seeding often increased production, and with improved conditions during the 1950's more surplus grain became available each year to be used for the next year's crops. As conditions did improve and individual plants grew larger and stronger and needed more space, a counter tendency set in. In some cases seeding too densely began to reduce total yields. Evidence that in some places the enthusiasm for close planting got out of hand is illustrated in the following passage from a December 1972 issue of *Peking Review*. It discusses the resolution of a small conflict over close planting at Tachai Brigade and is an interesting example of the respect scientific experiments have gained in the eyes of China's peasants.

Last year the question arose as to whether maize should be planted close together or more spaced out. A few years ago, the answer would have been the former. But now opinions differed. Some people said: "Close planting was certainly necessary when our land was poor. Now that it's more fertile, the plants would grow much too big and dense for the air and light to get through. Yields will surely suffer then." Comrade Chen Yung-kuei, secretary of the brigade Party branch, was of this opinion.

However, another Party branch committee member who disagreed challenged the others to a contest. In spring he planted maize the way he thought best in a plot next to Chen Yung-kuei's experimental one. The ears of maize on his plot came out small, and the stalks thin and the leaves sparse. People predicted failure but he refused to admit defeat. "The ears may be smaller," he thought, "but there are more of them. Who knows who'll win in the end?" Autumn harvest came, and his plot, the same size as Chen Yung-kuei's, produced 100 jin less. He was finally convinced.

Innovation in Farm Implements (Kung). The mechanization of agriculture has been a major topic of debate in China's development. While there was agreement that mechanization ultimately was essential, one faction favored delaying it until heavy industry could be established. As Liu Shao-chi argued for this position, in the 1950's:

Only with nationalization of industry can large quantities of machinery be supplied the peasants and only then will it be possible to nationalize the land and collectivise agriculture.

An opposing faction, led by Mao argued as follows:

In agriculture, with conditions as they are in our country cooperation must precede the use of big machinery . . . therefore we must on no account regard industry and agriculture, socialist industrialization and socialist transformation of

agriculture as two separate and isolated things, and on no account must we emphasize one and play down the other.

Otherwise, he argued, the natural inclination of the peasants toward petty entrepreneurship would redivide the countryside into exploiting and exploited classes. This would slow down the development of agricultural production and cripple efforts in large industry by choking off its supply of raw materials, thereby completely undermining the basis of the socialist state and making the long term mechanization of agriculture impossible.

In this struggle, initially behind the scenes, Mao's view eventually prevailed. Later, the issue became part of the mass debate and struggle of the Cultural Revolution in the late 1960s.

At Xigou Brigade, mechanization now means six tractors and two trucks. Before liberation and cooperation all burdens were carried on shoulder poles down narrow paths; now trucks run on hillside roads built during the Great Leap Forward. In the past (using oxen) it was difficult to cultivate more than the first few inches of soil; now, their tractors plow to a depth of .8 to 1.0 foot. They have also introduced machine threshing and set up a small factory to process their crops. One small group of workers has picked up the skills needed to repair farm tools and machinery and the brigade can even build its own electric motors.

Perhaps the most impressive single program at Xigou is the brigade reforestation program. During the brigade's early years, the leadership of Li Xun-da, a prominent political figure in Xigou, had been tied closely to the reforestation program. Li Xun-da, vice-chairman of the Shansi Province Revolutionary Committee, and member of the Central Committee of the Chinese Communist Party, had been a key person responsible for transforming the mountain regions into "a new village of socialism." He accomplished this by first creating mutual aid teams to reclaim the land during the 1942 drought period. Since these teams were so successful in 1951 Li led in the formation of an agricultural cooperative which even in its first year reaped a bumper harvest.

The reforestation project began in 1953, in the midst of the struggle over cooperation. Li Xun-da and Xun Da-lai (labor heroine and assistant secretary of the brigade Party branch) led some cooperative members in seeding 300 mu of barren mountain side with pine and cypress. Much controversy preceded this action. Many old people argued that it would be better to plant willows and poplars which would grow quickly and yield benefits before they died. Pines, they said, would take 100 years to grow and cypress 1,000. But they were countered by people who pointed out that willows and poplars, water loving plants, would not grow at all on the dry hillsides and that pines and cypress yield more useful wood. Another line of opposition came from

people who thought that no trees at all would grow on the Xigou hills. If it could be done, they argued, our forebearers would have reforested the land.

The results of the first year's sowings seemed to support the dissident viewpoints. Only about 10% of the expected seedlings grew. But Li countered that 10% wasn't a dismal failure and at least positively showed that trees could grow on the slopes. He encouraged people to learn from their mistakes, analyze reasons for the setback, and move forward.

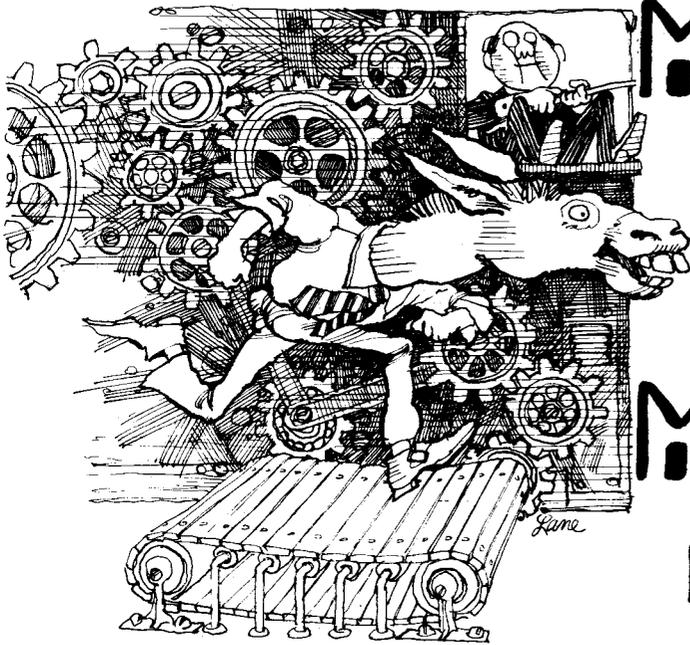


To this end the brigade sent a member to study the experience of other cooperatives with more experience planting trees. They learned that successful reforestation requires that the area to be seeded be blockaded to animals; grazing animals eat young trees. At Xigou itself the peasants decided that most seeds had been planted too deeply to germinate or so shallowly that they had been killed by the sun. It also appeared that many had been devoured by birds and insects. So the problem, they decided, was poor management of the seeding operation, not impossible physical conditions.

The following year the Xigou people tried again using their new knowledge. This time the planting succeeded, and since 1954 all the Xigou people have taken part in the reforestation.

There are now about 30 mu of pine and cypress for each household in the brigade (or more than 2,000 timber trees each). This represents a cash value of about 10,000 yuan (\$5,000). In five years the value of the timber will have grown to 10,000 yuan per person. In China, where 1,000 yuan a year is good pay for factory work, this represents a tremendous capital accumulation, and a very great collective economic achievement. It is also an important gain for the national economy in a country which inherited severely limited forestry resources at the time of the revolution. In the early 1950's only 8% of China's land area was forested as compared to 34% of the land in the Soviet Union and 33% of the land in the United States.

V.T.



MOTIVATION OR MANIPULATION MANAGEMENT PRACTICE AND IDEOLOGY

[The text below is an account of a symposium-confrontation on the topic of "job enrichment" which took place at Emmanuel College. The article which follows on the next page is an abridged version of a paper "Motivation or Manipulation" which was presented at this symposium.]

As far as Western Electric goes— It's an alright place, but as far as the work we're given, you could train a monkey, pay him six bananas, and you'd double the output.

There was but a sardonic humor in that appraisal of the work situation. Management's search for a solution to the alienation, boredom, and depersonalization of factory workers directed the course of a symposium entitled "The Corporation and the College as Social Engineers" which was staged at Emmanuel College, a Catholic women's liberal arts college in Boston on the evening of April 25. Participants in the colloquium included a panel of Emmanuel students and faculty, delegates from the Western Electric managerial strata, and a largely student audience numbering nearly a hundred and fifty.

The managers, voicing concern for the problem of worker alienation, discussed particular experiments conducted at Western Electric using motivational techniques. The contribution of the Emmanuel College participants was the following historical critique of practical and ideological programs designed to increase the commitment of workers to the work process.

During the course of the colloquium the managers increasingly antagonized the audience with their distorted view of the work situation at the Western Electric plant. A director of manufacturing interpreted first name familiarity as some sort of affinity between management and the laborer. With regret, a participant recalled the Spanish boy who lost his thumb in a machine accident because the English instructions were incomprehensible. If he hoped to suggest that managers are human too, his audience was unreceptive. They understood why it is that supervisors don't speak Spanish.

If they had convinced themselves of their own sincerity, their audience was not so malleable. Those whom they did not polarize with their pretentious concern for the worker, they aggravated by their condescending chauvinism.

The Vice-President of Western Electric responded to the disapproval of the audience with a compact speech on the graces of capitalism. His lecture revealed the fundamental premise that the material wealth of the United States is dependent upon the exploitation of the laborer and the impoverishment of underdeveloped countries around the world.

Ultimately, the Western Electric participants conceded that they had no conclusive solutions to the problem of meaningless work. Just as their allegiance to the capitalistic system blinds their perception of its grand-scale effects, so their very position in the managerial hierarchy does not permit them to entertain any real solutions. To ponder such answers would be to obliterate the necessity of their own existence.

J.O.

Power is an innate right of the organization. It is not only inherent but indispensable. For without it how can the organization accomplish its mission, viz. make money for their owners?

Douglas S. Sherwin in *Harvard Business Review*

In recent months business and popular magazines alike have devoted their pages to the problem of work. Dissatisfaction and boredom at the workplace were prominently featured in *Newsweek* last month. *Work in America*, a report to the Secretary of Health, Education, and Welfare, examines these problems in greater depth and challenges the view that the work ethic is on the decline and a welfare ethic taking its place. Moreover, corporations are rapidly rethinking and rearranging their traditional methods of control. There are currently numerous experiments in plants which focus upon increased worker participation, enrichment of narrow and dull jobs, and better training for supervisors to deal with problems of workers.

Job dissatisfaction and boredom are not new; in fact, as our analysis will show, they have been around from the beginning of industrialization, but they have often been overshadowed by more immediate material problems like starvation wages and poor housing. So what makes them a recognized problem now? Bored and dissatisfied workers lower productivity and thus decrease profits, thereby hitting the corporate owners where it hurts. Some of the symptoms are high turnover rates (workers quitting and switching frequently), high absentee rates, low output per worker (producing less than they are capable of), and acts of sabotage [1] (causing the work process to be disrupted or the product to be defective) [2]. Such alienation — lack of control over one's own life, sense of meaninglessness and social isolation [3] — is not confined to the most degraded type of work, such as that at the assembly line where workers are forced to act as robots doing fragmented tasks in unending monotony, but it affects other blue collar workers as well and the supposedly more privileged stratum of white collar or office workers.

It is our contention in this paper that after a study of the history and current practice of capitalist corporations, it is clear that any programs designed to increase motivation and commitment of workers to their work, be they called humanization of work or job enlargement, are only instituted to counteract present or future losses in profits—profits which the workers do not own and over whose disposition they have no control. In other words, within the context of the capitalist corporation any improvements in the work environment are only a means to an end, rather than an end in itself. Workers are very sensitive to this and they are resentful of the manipulation which management uses to convince them that they share the same goals, that they are a big happy family in which everyone benefits if everyone does his/her

job. But since they have to work in order to eat, workers also often find themselves quite impotent to do anything about this situation. Furthermore, since the purpose of the capitalist corporation, as any manager will tell you, is to make ever-increasing profits for the owners, there are clear limitations on the domain in which workers can be allowed to make decisions. The really important decisions will have to remain in the hands of a few executives and owners and they require a hierarchical structure, thus emphasizing not merely a division of labor but a clear-cut division of interests.

Social Engineering: An Overview

Organized capitalism and individual entrepreneurs have always had to deal with a resistant workforce which balked against the exploitative conditions to which they were subjected in the factory system. During the first few decades, coercive measures were generally effective to insure the smooth operation of production because of the workers' extreme need and their lack of experience in organizing themselves. However, in the course of the 19th century, entrepreneurs increasingly realized that coercion had its limitations and that it might very effectively be supplemented with psychological mechanisms that would insure the internalization of the value of hard work to be performed for someone else's benefit. To some extent this function had already been performed by the Protestant Ethic [4]. Nonetheless, in an age of increasing secularization, the rising capitalists (then also commonly called the "Robber Barons") were themselves still greatly in need of justifying their practices; a more up-to-date ideology was required. Herbert Spencer obliged by providing the "survival of the fittest" theory which had the additional advantage of presenting itself as science. Social Darwinism, [5] as this theory is also known, holds that in the struggle for social existence, the strong survive and the weak go under. The strong are also defined as morally the fittest. Applied to the factory, the entrepreneur was obviously the fittest to lead while the workers had to compete with one another to show that they, too, could succeed. This ideology not only legitimated the hierarchical organization but also reinforced individualism, thereby counteracting the combination of workers in unions. Social Darwinism clearly recognized that workers and entrepreneurs were in conflict with one another and that some select few were destined to win.

This ideology ceased to be sufficient in itself when the rapid rise of labor unions forced the capitalists to recognize that their supremacy was being challenged by organized labor. The presumably unfit masses were now banding together, [6] rather than competing as individuals, but in the factory all power continued in the hands of the owners. However, the latter were forced to make some concessions. At the beginning of the 20th century, Frederick Taylor presented a new concept: scientific management, also known as Taylorism. Scientific management emphasized the development of precise measures of

worker efficiency and the use of piece work, premiums, and bonuses as incentives. The goal was, as ever, to maximize profits by maximizing productivity; and productivity was to be maximized by scientifically determining who was best suited for a particular job and how that job could be done most efficiently. The accompanying ideology, which Taylor believed was even more important than the specific techniques, constituted a considerable deviation from the "survival of the fittest" ideology. Scientific management, as an ideology, assumed that the new scientific method would create social harmony by showing that both workers and employers in cooperation would benefit from scientific management and that industrial conflict was unnecessary. However, in response to the threat of unionization, Taylorism continued to stress individualism and competitiveness. Furthermore, Taylorism laid the groundwork for the disciplines of industrial psychology and industrial sociology which have traditionally worked hand-in-hand with industrial management.

Scientific management emerged in response to other developments, besides militant trade-unionism. For one, companies were growing ever larger, increasingly requiring an administrative bureaucracy run by managers. The streamlining of business practices through the application of Taylorism was merely part of a trend toward greater rationalization of production. In this process the worker was still viewed as just a cog in the machinery which has to be kept running smoothly. The basic assumption



behind Taylorism, as in previous theory and practice, was that workers best respond to material incentives, i.e. wage increases in return for higher production.

By the mid-1920's the concept of material incentives as the sole means to motivate workers was under heavy fire. Elton Mayo, a professor at the Harvard Business School opened a philosophical discussion and offered a new definition of the worker as a human being, not a robot. He was a chief advocate of the "human relations" approach. Mayo postulated a natural solidarity among workers which took precedence over purely economic interest. This social element, according to Mayo, is non-rational. The worker is a sentimental fellow who seeks the approval of his peers. Only a small elite, the managers, have the capacity to learn to be rational and that makes them natural leaders. The task of managers is to guide workers in how to get along with others, to motivate them and to make them see the wisdom of managerial decisions. The fine art of manipulation was increasingly relied upon by managers.

Under Mayo's direction the pioneering work [7] in the new approach to motivating workers was undertaken at the Hawthorne plant of Western Electric. This study, described below, lasted from 1927 to 1932.[8] Its findings were published in the mid and late thirties and they are still today widely applied. The spirit of the human relations school pervades management training today although some modifications have been made, notably in the current experiments with designing more fulfilling work.

By the mid-1950's the moral and ideological implications of this approach had come to full fruition. William H. Whyte's critical study *The Organization Man* points out the logical extension of "human relations" into stifling corporatism and groupism. This concept of the corporation as the big happy family is a form of false collectivization and exploits basic social needs of workers for the ends of the corporate owners. Group adjustment becomes the paramount value rather than social change.

These methods may have been somewhat successful among white collar workers in generating loyalty, but their differential application with respect to blue collar workers has not substantially altered the existing feelings of resentment especially in the latter group. Today these techniques are still used, but given the present level of discussion of worker dissatisfaction, it is clear that management is hard-pressed for new solutions. We will discuss some of those below. First, however, we wish to deal briefly with some of the mechanisms whereby these various methods received widespread acceptance.

Science, Ideology and Education

As the previous exposition indicates, periodic changes in the definition of human nature have been an important means with which industrial management has tried to justify its changing tactics of enlisting greater cooperation from workers. Neither these changed tactics nor the changed views of human nature have evolved in random fashion. Each of these adjustments is clearly traceable to



the rise or decline of particular historical social and economic forces which challenged management's assumed right to make decisions affecting the lives of workers.

This is not to say that the image of human nature, as articulated by the British liberals in the wake of the Industrial Revolution, was abandoned; but considerable modifications were introduced as the interests of the industrialists required it.

Because of persistent problems of motivation, it has now been recognized that humans are not only motivated by the pursuit of wealth and social contact but that intrinsic satisfaction and fulfillment in worth and control over their own lives are even more important factors. It is interesting to note, and surely no accident, that these last two elements, fulfillment and control, have been virtually absent from the capitalist view of human nature but that they have precisely been at the center of the Marxian conception of human nature as early as 1844 [9]. We will discuss in a subsequent section why this addition in particular is bound to cause corporate managers lots of headaches.

Many of these redefinitions were presented in the

guise of science, notably industrial psychology and industrial sociology, even though statements on human nature generally fall in the realm of philosophy. This was all the more important since the changing needs of industry, e.g. more complex organization and the resulting requirement for more office workers, competition and pressures for greater productivity, had to be accompanied by changing conceptions of workers. Particularly in the early 20th century when industry needed more literate workers, entrepreneurs quite actively influenced the format and philosophy of the newly emerging high schools. After all, their labor force was to be trained in them. Likewise, industrialists have consistently, and not all that subtly, influenced the policies of universities by serving on the boards of trustees.

Despite the myth that schools and universities are neutral, the ideology that prevails in industry is taught in the schools, and it is also with the help of academics such as Elton Mayo generated at universities. Not only do universities provide the research for social engineering in corporations, but they have been, and are increasingly, apply-

ing principles of "good" management within their own walls. Universities are subject to cost-benefit analyses; management by objectives is practised in junior colleges; and a university in Boston, Northeastern, actually operates at a profit.

Let us now take a closer look at some examples.

Hawthorne and Beyond

The logic of cost and efficiency express the values of the formal organization; the logic of sentiments expresses the values of the informal organization.

Roethlisberger and Dickson,
Management and the Worker

The Hawthorne experiment was originally set up to test the effect of various independent factors of working conditions on productivity. Some of the variables included lighting, humidity, rest periods, diet, length of work day, medical care and wage incentives. The experiments dealt with a small isolated group of six women workers who were removed from their normal work environment and placed in a special observation room, The Relay Assembly Test Room. (The plant made telephone switching equipment.) The most striking discovery of this series of experiments is the "Hawthorne effect": Very soon after the start of the experiment the productivity of these women increased continuously regardless of the variables tested. Even when the variables were removed and conditions in the test room were returned to what they had been at the beginning, their productivity continued to go up. Although the women themselves suggested that this behavior was the result of having no real boss in this situation, this answer was not seen as the crucial factor, and the researchers, Roethlisberger and Dickson, dismissed this observation rapidly. Instead they focused on the importance of paying more personal attention to workers and making them feel more important.

The other classic experiment in the Hawthorne studies is the Bank Wiring Observation Room Experiment, in which a small group of workers forming a complete production unit were set up in an experiment room. The group included 9 wiremen, 3 soldermen, and 2 inspectors; that is, unskilled and supervisory workers. These men were responsible for wiring banks of terminals for switches for central office telephone equipment. Their output and interaction was studied by a social science observer. The men in this unit were paid according to a system of group piecework. The more work the group turned out, the more money each individual worker would earn. The assumption of those who set up this group piecework rate incentive plan was that the workers would work up to the limit set by fatigue to increase individual and group output. As it turned out, however, the workers did not share this view, and they had their own informal rules and norms about how much work to turn out and how to act toward one another:

1. Don't turn out too much work, because that's "rate busting".
2. Don't turn out too little, because that's being a "chiseler".
3. Don't tell a supervisor anything detrimental to another worker, because that's "squealing".
4. Don't try to maintain social distance or act officious. (This applied particularly to the inspectors in the group.)

The men in the Bank Wiring Experiment had set themselves a quota of two pieces of equipment a day, although they could have turned out more. Faster workers would help slower ones; all would work faster in the morning and slow down in the afternoon. In particular the wiremen and the soldermen would switch jobs for a while in order to relieve the monotony of doing a single operation for the entire time, although this violated company rules.

The researchers approached the project with the preconception that "rational" behavior consisted of individual, competitive wage maximization even in a group. The workers thought and acted along the lines of a different rationality. They were afraid that during the Depression which was beginning at that time, they might run out of materials and thus be out of a job altogether. Such considerations were thought by the experimenters to be non-rational.[10]

The lessons of the Hawthorne Studies were many. Although the "Hawthorne effect" is now part of the general vocabulary, the most far-reaching discovery was that of the informal groups within the formal organization structure. One result of these studies was the institution of personnel counseling in the Western Electric Company.

The discovery of the informal group is all important in today's management practice. Human relations fostering happy motivated workers makes for corporate profits. Sensitivity training and transactional analysis are present-day tools of corporate management. The counseling system is already built in, not quite so institutionally as at Western Electric, but managers everywhere and at all levels require counseling skills. These are all aimed at helping the worker develop an increased sense of self-value and at the same time helping him to look at the corporation as vital to the survival and happiness of all employees. All social and political problems are thus seen as personal problems amenable to psychological modifications rather than to collective or political solutions. It also shows clearly how the paternalistic conception of the corporation as a big happy family is a logical outgrowth of this approach.

The authors of *Management and the Worker* do not go into an analysis of such related phenomena as increased sense of freedom, control or self-management, or the lack of discipline (which disturbed observing supervisors and resulted in the removal of two workers), and the increased talking and boisterousness which was eventually forbidden.

Some of these aspects have been taken up by those who are presently planning changed work environments. As mentioned earlier in this paper, some



Western Electric Manipulators

of the current innovations center on job enlargement and more worker participation. Virtually all the experiments in the United States in this area were begun in the 1960's in response to the realization that the present workforce can no longer be sufficiently manipulated by Taylorism or the human relations approach. Characteristically, job enlargement and worker participation programs have been instituted on a small scale in separate divisions of existing companies or in newly built plants such as a pet food plant in the Midwest. [11] In this latter example, a new facility employing 70 workers was organized along the lines of autonomous work groups (teams of 7 to 14 workers and a team leader, collectively responsible for a part of the production or packaging process, including decision making in that area, temporary redistribution of tasks, selection of people for plant-wide committees), integrated support functions (reducing fragmentation of work by having team members share tasks formerly confined to industrial engineers, personnel managers and maintenance works, etc.) challenging job assignments derived from the integrated support functions, job mobility and monetary rewards for learning, facilitation of leadership (eventually teams are to be self-directed, thus possibly eliminating the team leader), access to managerial decision information and self-government for the plant community. What have been some of the difficulties? Major problems arose in

connection with deciding differential pay rates within the teams and management at corporate headquarters and in the plant itself has difficulties in accepting its reduced role. Overhead costs, however, have been reduced and production has increased. But it has to be kept in mind that this is a continuous process plant [12], that it employs one third fewer workers than originally planned, thus creating even fewer jobs for the community in which it is located, that the product is perceived by the workers as socially useful and that the whole operation is quite small compared to the huge companies in which a large percentage of the labor force is employed.

In another instance management at General Electric in Lynn, where they tried a similar self-structured job enrichment program in the jet engine division, feels that they opened a Pandora's Box by allowing workers to control their immediate environment. Who is to say what workers will want to control next once they have been given a taste for self-management? Also such an experiment within a plant whets the appetite of those still in traditional jobs. Thus in the case of GE, management is phasing out the project despite the fact that the workers and the union would like to see it continue. It seems that the two approaches, traditional authoritarian and experimental participatory, pose major problems for management if they coexist under the same roof.

Hence management's desire to set the experiments up in new plants or to give clearly circumscribed limited control in the entire old plant.

An almost point-by-point confirmation of our criticisms comes from a rather unexpected source, *The Harvard Business Review*. Thomas H. Fitzgerald in an article *Why Motivation Theory Doesn't Work*, (July-August 1971) clearly states that even job enlargement and worker participation will not solve the problems embedded in the very structure of American industrial organization. Thus, he states:

The subjects of participation, moreover, are not necessarily restricted to those few matters that management considers to be of direct, personal interest to employees, or to those plans and decisions which will benefit from employee advice. Neither of these positions can be maintained for long without (a) being recognized by employees as manipulative or (b) leading to expectations for wider and more significant involvement. Why do they only ask us about plans for painting the office and not about replacing this old equipment and rearranging the layout? (and whether we should be making nuclear warheads or plastic flowers or deodorant sprays?—the authors)

and he goes on:

Aside from the real costs in reduced effectiveness the impact of this new participation on the process and structure of management, though hard to estimate, must be anticipated, because what is really involved is politics, the conscious sharing of control and power. History does not offer many examples of oligarchies that have abdicated with grace and goodwill.

Aside from saying that the problem is structural and requires fundamental changes he has no suggestions to put in the place of current practices. We consider that a rather realistic assessment in light of the fact that Fitzgerald is not willing to propose a complete change of the system.

We would therefore like to state our conclusions.

1. We would very much like to see all workers derive fulfillment from their work and control all aspects of their lives including what shall be produced. It is quite possible that temporary improvements can be achieved for some through current management practices but we have no illusions that they will be of lasting effect. The Hawthorne effect will continue to be a major factor in the initial rises in productivity. Very little is known about what happens when the novelty wears off.

2. Alienation will be a perennial problem under capitalism because of its requirement of hierarchy and owner control.

3. Many industries, especially the automobile industry, do not lend themselves to job enlargement and worker participation, not because the workers are lazy or stupid but because of the inherently meaningless work that is performed in them.

4. There is evidence that these new techniques amount to no more than a band-aid approach in response to specific problems. As in the case of General Electric, job enlargement may be instituted during times of union militancy and abolished when the economic situation has changed toward greater unemployment and unions are forced to hang onto what they have rather than demanding more.

5. The profit motive which must and does govern the capitalistic corporation is not compatible with true fulfillment of the workers and they are conscious of this.

6. Not until *human needs* rather than production for the profit of the few determine the goals and means of a society can there be real participation and control by the people. It may well be that particularly in this lopsided, overdeveloped society of ours, efficiency and productivity would have to become secondary.

7. Liberation from alienation cannot be granted to the powerless by those in power, nor can it be administered piece-meal, it has to be struggled for and won by those without power.

P.B., S.C., B.F., C.H., S.V.

NOTES

- [1] The word sabotage is derived from the French word for wooden shoe, *sabot*, which workers threw into the machinery.
- [2] This is not to say that all shoddy products are to be blamed on the workers, for it is well known that built-in obsolescence—factors making for rapid deterioration and devaluation—are intentional in the design of many products and in the use of inferior raw materials over which the worker has no control. The function of built-in obsolescence is to force the consumer to replace a product frequently, thereby generating more need for its production.
- [3] For a good discussion of alienation in four different industries, see Robert Blauner *Alienation and Freedom*.
- [4] Max Weber *The Protestant Ethic and the Spirit of Capitalism* and R. H. Tawney *Religion and the Rise of Capitalism*.
- [5] Richard Hofstadter *Social Darwinism in American Thought*.
- [6] It is less well known that at that time the entrepreneurs organized themselves in employers associations. With their smaller numbers and greater wealth they commanded influence far beyond the factory gates, and they used their power violently to suppress unions. Much of the information in this section is taken from Reinhard Bendix *Work and Industry*.
- [7] Mayo was influenced by the writings of Vilfredo Pareto, the Italian sociologist, who influenced Mussolini. "The fascists claimed Pareto as one of their own," Lewis Coser *Masters of Sociological Thought*, p. 422.
- [8] Fritz J. Roethlisberger and William J. Dickson *Management and the Worker*.
- [9] Karl Marx *Economic and Philosophical Manuscripts of 1844*. A further fundamental difference between Marx and the English liberals is that Marx did not subscribe to a static, ahistorical concept of human nature.
- [10] George Homans *The Human Group* p. 64.
- [11] Richard E. Walton *How to Counter Alienation in the Plant*, *Harvard Business Review*; November, 1972.
- [12] Blauner *op. cit.* has shown that highly automated continuous process technology even under traditional working conditions generates less alienation.

women's biology in a man's world

SOME ISSUES AND QUESTIONS

"Yes . . . but women are different" says the well-intentioned liberal, ready to support civil rights and other struggles of women. "You really can't trust women, they are too emotional, they get hysterical, they're just different . . ." says the employer, justifying having women in lowpaying, low-status positions. "She is different, she is not like the other women", say the colleagues of the woman who "made it".

What do they mean when they say "different"? Different from what, the rest of the human species? And why are women always being measured against men? Are men "normal" and women biological deviants? Why have women been studied practically only by males? Do these men carry into the study of women society's prejudices and values? Does the scientist furnish the culture with new ideas about women, stretching the range of her potential or does the culture "dictate" to the scientist what he is going to find and how he is going to present it? Does culture make Biology? These are some of the questions that surround the study of women. Women's biology offers a fresh approach to the question of the relation between science and society.

Biology is Destiny. Would-be scientific arguments have often been used to rationalize and legitimize every aspect of life. "The female animal", a paper by Carroll and Charles Rosenberg[1], brilliantly links the biological view of women with their role in nineteenth-century America. Briefly: the Victorian woman's ideal characteristics: nurturance, intuitive morality, domesticity, passivity and affection were all assumed to have a deeply rooted biological basis. Women, nineteenth century Biology said, are "different", weaker, with smaller skulls, more delicate muscles, more irritable, with smaller nerves. Physicians saw women as the product of their reproductive system: "as if the Almighty, in creating the female sex had taken the uterus, and built up a woman around it"[2]. The uterus, it was assumed, was connected to the central nervous system, and this link between ovaries, uterus and nervous system was the logical basis for the ideas that any disorder of the reproductive system could cause pathological reactions in any other part of the body. Childless women were supposed to have a shorter life-span, their nervous systems under constant pressure, their unfulfilled reproductive organs more prone to cancer and other illnesses. When American women, dissatisfied with traditional sex roles began to be involved

in education, social movements and birth control, American physicians announced disaster for the species. The reasoning went something of this sort: American women were considered inferior physically to European women and many scientific authorities were convinced that education was the source of this. During puberty and adolescence when the female reproductive system matures, she would be distracted into learning and her vital energies would be diverted from the achievement of true womanhood. If too much energy went to develop the brain, the ovaries would suffer. They also emphasized that it was the mother's reproductive system which most directly affected her offspring so that women's violation of biological laws (too much education, too much activity) could only harm the species.

Has this streak really disappeared from the culture? Are there twentieth century counterparts of the physicians of the Victorian era? Who is saying now what is "natural" for women? In our times, Psychology supposedly furnishes society with insights about human personality and behavior. Bruno Bettelheim, widely-known psychologist states: "We must start with the realization that as much as women want to be good scientists and engineers, they want first and foremost to be womanly companions of men and to be mothers".[3] This type of ideology clearly prepares the ground for natural scientists to propose androcentric (male-centered) theories of human nature and human evolution.

Desmond Morris, writing for general audiences, uses his training as a zoologist to discuss "the fundamental biological nature of our species". In *The Naked Ape* [4], 22nd printing in America, he says "it is the biological nature of the beast that has moulded the social structure of civilization". Declaring that the naked ape is the sexiest primate alive, he enumerates the reasons that made this happen " . . . the females had to stay put and mind the babies while the males went hunting" . . . "the males had to be sure that their females were going to be faithful to them when they left them alone to go hunting . . .". It's all "natural". Monogamy is the natural condition for humans and of course if there is some polygamy it is a male with several females, because the risky hunting life might result in fewer males than females. And why do women have breasts, round buttocks and hair in the armpit and around the female pubis? Why, because that is how men like women to

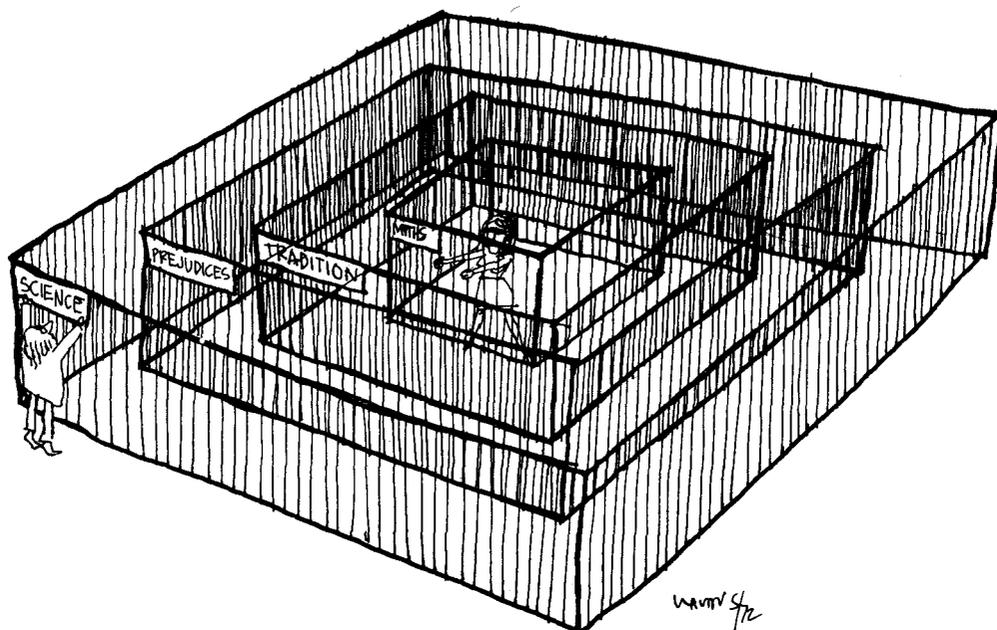
be . . . Our bodies are the result of men's sexual preferences, and that is how it all happened. The implications are clear: we exist as secondary life forms, our own physical being derives from men, we are truly Adam's rib. It is not hard for any attentive reader to detect the countless fallacies on which his book is based, but scanty evidence and limited cultural perspective do not deter Morris from sweeping generalizations. "It's the sort of book that changes people's lives" says the *Sunday Times*. "The chapter on sex is his best" says the *Times*. For the record, a three page article by anthropologist Lila Leibowitz [5] quickly disposes of most of his arguments on who shaped the body of women . . .

Another example of androcentric thinking disguised as science is "Men in Groups" by Lionel Tiger [6], more pernicious and probably more efficient at helping keep women in their place. Tiger, an associate professor of anthropology at Rutgers, offers to us the interesting discovery that the secondary status of women is due to their inability to form viable associations among themselves, or to maintain a high standard when combining, non-sexually with men. He warns: "It may constitute a revolutionary and perhaps hazardous social change with numerous latent consequences should women ever enter politics in great numbers". He thinks that women lack "male bonding", which he sees as the "spinal column of a community". Women, he assures us, do not form bonds, and there is nothing we can do about this, it's "natural". This book, which clearly tries to offer a "scientific" explanation for male dominance, is based on misrepresentation and selective quoting of data [7]. He doesn't have much evidence for what he is saying but he is saying it anyhow . . . He ignores data, he selects data, he quotes just what he wishes to best make his case.

Compare sexism with racism. We know that modern racism was fostered by the work of pseudoscientists. Briefly, from de Gobineau's (1853-1855) *Essay on the Inequality of the Races* to Stuart Chamberlain's *Foundations of the Nineteenth Century* ran a streak that offered the intellectual justification for the myth of the Aryan race. Hitler borrowed from Chamberlain's ideas in the *Mein Kampf*. In America, Madison Grant, a naturalist at the American Museum of Natural History of New York in his book *The Passing of the Great Race* argued that people of Nordic extraction were superior. He acted as advisor to the committees legislating on immigration quotas. Quotas were set up for immigrants, favoring those from Great Britain, the Scandinavian countries and Germany. Differences between people have over and over been used as the excuse to exclude them from participating as equals in the works of the society. Blacks have "rhythm", women have "intuition" and they are both ill-fitted to interact efficiently in modern technological society. They are as we all know, "different".

Hormones and Women

Another area which is a reservoir for the "naturalists" and of potential danger for women who will let themselves be intimidated by the "experts" is the area of hormone research. Well, everybody knows that females and males differ in sex hormones and since sex hormones enter the brain, you might run into a "scientist" who will say that there must be innate differences in "nature". The only thing that can be said is that there are differences in physiological state [8]. How are these relevant to behavior? This is a complex relationship: any physiological state can lead to a variety of emo-



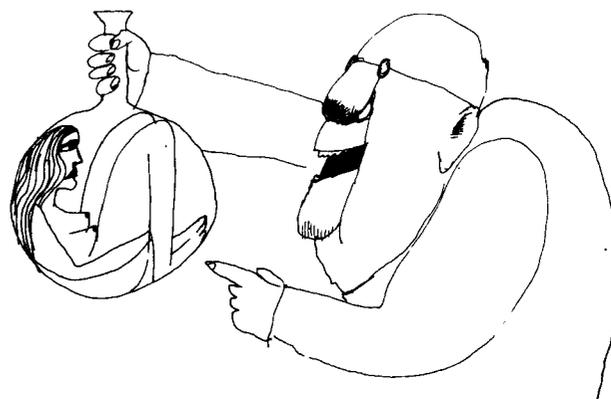
tional states and outward behavior. depending on the social situation. Estelle Ramey, professor at the Georgetown University School of Medicine, discusses the evidence in her paper "Sex Hormones and Executive Ability". [9] She clearly states that for humans, it is the human cerebral cortex, not the endocrine system (which produces hormones) that confers the almost infinite variability characteristic of human responses to stimuli from the environment. What are the innate and immutable behavioral characteristics of the adult that can be attributed to the hormonal differences in the two sexes? More and more evidence suggests that humans are psychologically neutral as far as sex is concerned at birth. [10, 11] This psychosexual neutrality eventually develops into one or other orientation depending on the life experiences which individuals will encounter. We should be talking about *our social interpretation* of what is a man and what is a woman. This is called "gender role" and it involves a person's own sex image, manner, interests, dreams, plays, reaction to situations, casual comments, spontaneous conversations. As reviewed in Ramey's paper, in humans the attempts to correlate "typically" male or female gender roles with the basic physiology of development of the sex organs have not been very successful. In fact, there is evidence that genetic identity may be entirely overridden by early childhood training.

What about testosterone, the male hormone favorite to explain the "differences"? Precisely the choice of this hormone as significant shows the bias of these studies. The fact is that behavior characteristic of aggression is associated with changes in practically all the hormonal system. The animal studies themselves show that testosterone levels can be associated with pecking order only under certain conditions:

The same monkey with high testosterone levels when he is at the top of the hierarchy can be shown to have low testosterone levels in a different social order. In other words, it looks as if the high testosterone levels do not determine ranking order or leadership but the behavioral coordinates of being top monkey may change testosterone secretion along with many other physiological parameters.[9]

Sex hormones surely play a role in conditioning aspects of behavior in humans; the problem is to separate the imprinting due to hormonal mediation and the one due to learning. There is a tendency to extrapolate from animal studies (rats and primates) whatever seems to fit with the rather simplistic notion that hormones are destiny. There is serious good research being done with the intent of distinguishing what are the facts and what are the fantasies in the area of sex differences. [12] There is a ray of sanity, and I quote again Ramey's paper:

There can be no better conclusion to this rather pointless argument than to quote from the brochure that advertises a new book to be published



in the Fall of 1972. The authors are the great authorities in this field, John Money and Anke Ehrhardt and the book is called "Man and Woman, -Boy and Girl". These experienced investigators are described as having reached the following conclusions: "In general, the authors' research suggests that there are as great differences between individual men and individual women as there are between members of opposite sexes. They conclude, therefore, that the social roles of men and women should be related to individual needs rather than to membership in a sexual caste." [9]

Birth Control and Contraception

The myth of the neutrality of scientific research explodes finally on the area of contraception. We all know that both the female and male reproductive systems are involved in the creation of a new being. However, 80% of the money and effort for new research in contraception is devoted to research on the females and the residual 20% for the male. While there are a variety of methods (awkward and inefficient as they are or plain dangerous) for the female, there is only one available for the male, the condom. The explanations offered for this situation run as follows: scientists know more about women because women have babies; women are the ones who get pregnant so it is safer and psychologically more reassuring to be in charge of one's own contraception because who would trust a man anyhow. Apart from the sad fact that many women do enter into sexual relations with men they should not trust, the reality is that scientists do know more about the female reproductive system simply because they have studied it for many more years and have conducted their experiments on the material of their interest.

A balanced scientific approach would have required as intense a study on the male reproductive system, of which we certainly know very little, and adequate experimentation on the male subjects. By explicit statements

of workers in the field we know that it is easier to experiment on women than on men:

Women can easily be assembled for clinical studies through their association with Planned Parenthood clinics and individual obstetricians or gynecologists; there exists no simple mechanism for assembling similar groups of males for clinical experimentation. [13]

which clearly shows the scientist being caught in the value system of the society he is working in. Not only are women more expendable than men but also because of their subordinate position they are less likely to ask embarrassing questions or demand reparations (see Veatch's article [14], a report documenting research on side effects of the pill on Mexican women, who were unaware that they were part of an experiment and the pregnancies that ensued from it.)

The question of safety of oral contraceptives has often been dismissed as a sensationalist radical move. This is not so. The first book on the issue, Barbara Seaman's *The Doctor's Case Against the Pill* [15], opened the eyes of women activists to another area in which women were being exploited. We still do not know what is going on with the pill and cancer. The National Cancer Institute is working on programs to test if the pill can both cause and prevent cancer [16]. In the meantime new reports keep coming in including one about a piece of research discovering that women using birth control pills experience bodily depletion of vitamin C [17]. A bit of information that should give some perspective on this issue is the fact that after a three year study of the pill and the IUD by the Soviet Academy of Medicine, the Russians decided to produce IUD's but are still researching hormonal contraceptives, in other words, there is no pill for Russian women as yet [15].

In the case of male contraception unusual stress is put on the need of finding agents that would inhibit sperm production without interfering with potency, libido or causing nausea and headaches. To quote the Westoffs in their book *From Now to Zero*:

In fact the perfect method of contraception may in the end depend on incapacitating the sperm rather than tampering with the female system.

and then,

How will men feel about receiving a capsule? Will they give up this one stronghold of male ego, even if temporarily? Will they voluntarily agree to sterilize themselves as nine million women Pill users in this country are doing every day? Or will they balk? [18]

Let us remember at this point that medicine and scientific research are male strongholds. Men have studied

women and have somehow put themselves above nature. We know so little about the male reproductive system that news of hormonal and emotional cycles in men are greeted with disbelief and genuine shock [19,20]. But who benefits from this ideology? Who runs the entire scientific and technological establishment? Needless to say, a small powerful elite, mainly white males, whose interests run opposite to those of the great majority of people, both men and women.

A final point: to assume that because women bear children they have to be the sole partner responsible for contraception makes as much sense as to assume that since blacks have pigmented skins they should be out in the field doing physical work under the sun because they are "naturally" fitted; they will not get a sunburn. That is nothing less than cultural exploitation of natural differences between people in order to deny them the full range of options, and it should be recognized as such.

R.A.

NOTES

- [1] Carroll and Charles Rosenberg, *The Female Animal: Medical and Biological Views of Woman and Her Role in Nineteenth Century America*, University of Pennsylvania, Manuscript, 1972.
- [2] Charles D. Meigs, "Lecture on some of the Distinctive Characteristics of the female." Delivered before the Class of the Jefferson Medical College, January 5, 1847 (Philadelphia, 1847). Quoted in the Rosenbergs' paper.
- [3] Bruno Bettelheim, "The Commitment required of a woman entering a scientific profession in present day American society" in "Woman and the Scientific Professions," the MIT symposium on American Women in Science and Engineering, 1965.
- [4] Desmond Morris, *The Naked Ape*, Dell, 1967.
- [5] Lila Leibowitz, "Desmond Morris is Wrong About Breasts, Buttocks and Body Hair," *Psychology Today*, 3, 9, 1970.
- [6] Lionel Tiger, *Men in Groups*, Random House, 1969.
- [7] Morton H. Fried, "Mankind excluding woman," review of Lionel Tiger's *Men in Groups in Science*, 29 August, 1969.
- [8] Naomi Weisstein, "Psychology Constructs the Female," New England Free Press, 1970.
- [9] Estelle Ramey, "Sex Hormones and Executive Ability," paper presented at the New York Academy of Science's conference on "Successful Women in Science," 1972.
- [10] John Money, G. H. Hampson and J. L. Hampson, "Imprinting and the establishment of the gender role," *Arch. Neurol. Psychiat.* 77: 333, 1957. Quoted in Ramey.
- [11] J. L. Hampson and G. H. Hampson, "The ontogenesis of sexual behavior in man," in *Sex and Internal Secretions*, W. C. Young, ed., Williams and Wilkins, Baltimore, 1961.
- [12] Frances Lang, "Feminine, Masculine," from *Off Our Backs*, January, 1973.
- [13] Carl Djerassi, "Birth Control in 1984," *Science*, September 4, 1970.
- [14] C. Veatch, "Experimental Pregnancy," *Hastings Center Report*, 1971.
- [15] Barbara Seaman, *The Doctor's Case Against the Pill*, Avon Books, 1970.
- [16] *Science News*, "The pill: confusion over cancer" issue, November 11, 1972.
- [17] Michael Briggs and Maxine Briggs, *Nature*, August 4, 1972.
- [18] Leslie Aldridge Westoff and Charles Westoff, *From Now to Zero*, Little, Brown and Company, 1971.
- [19] Estelle Ramey, "Men's Cycles," *Ms.*, Spring, 1972.
- [20] Gay Gaer Luce, *Body Time*, Bantam Books, 1971.

Letters continued from p. 13

justify these activities with such words as 'freedom' and 'democracy'. The problem with rhetoric arises when people, in attempting to share their perception of reality, fail to substantiate it for others, or fail to show that there are real alternatives: that outrageous situations are not simply inevitable features of an inherently corrupt world. If some words have become 'polluted', it is usually because we haven't done the homework justifying them. This allows people who haven't encountered the full impact of the evidence on which a 'radical analysis' is based, to back away from the otherwise jolting conclusions. We must not let this happen! Many of us will have to contribute through struggle, speaking and writing, to remove rhetoric from truth.

However, in the specific case of the article on genocide, if better documentation and analysis are available, we welcome it. The March Collective thought, and we concur, that in spite of the article's limitations (see previous letter) it was very important that the issue of U.S. birth control policies and their implications be discussed.

SESPA,

I'd like to be a member. As I am a high school student (unemployed) I fall into the "indigent" category . . . Right now, I'm not active in any SESPA chapter. I will probably contact one of the local chapters, but, due to right wing parents and lack of transportation, I doubt that I can be an active member of SESPA for the next year. A year from now, however, I should be attending college (making it impossible for my parents to keep track of me) and a possessor of a real live driver's license (transportation).

One organization I am active in is the . . . Student Union. I'm not sure it deserves the title "organization" because about all we have is a name right now. (It is about two weeks old.) Barring collapse, one of the issues we will be dealing with will be our school's brand of "progressive" education—Skinnerish "programmed learning" and a version of I.P.I. they call "learning packages". Translated—we might as well have stuck with book and lecture. Right now, I'm trying to put together some information on these behavioristic "educational" monstrosities so that we can fight against them better than dear ol' Superintendant . . . and his puppet show can defend them. If SESPA could help us by supplying information on this educational idiocy, we would appreciate it.

If it is at all possible, send the magazine in an envelope or something. Right wing parents get very upset over left wing publications coming to their good holy (?) all-American (??) daughter. If they see *Science for the People*, and they realize it's not the same as *Science News*, *Scientific American*, *Technology Review*, etc.—I am screwed.

Peace,
T.L.

Dear Brother David,

S.T.A.R.T. (Special Treatment and Rehabilitation Training) is in the words of Norman A. Carlson, Director, U.S. Bureau of Prisons, "An attempt to develop behavioral and attitudinal changes in offenders who have not adjusted satisfactorily to institutional settings . . ." In terms of personality characteristics Carlson asks specifically for those individuals that are "resistive to authority".

How does one get selected for S.T.A.R.T.? When a prisoner is considered a long-term segregation case at his respective concentration camp and the officials plan to keep him in punitive segregation for an indefinite period of time, the Associate Warden of Custody of that prison contacts the Director of the Bureau of Prisons and in turn the prisoner is approved for S.T.A.R.T. without his consent, and in spite of his protest, at a subsequent date he, the prisoner, is brought here to the U.S. Medical Center at Springfield, Mo. and placed in unit 10 D S.T.A.R.T. Of course, some prisoners are arbitrarily and capriciously transferred here.

S.T.A.R.T. is situated in an isolated maximum security section of the Medical Center, and it is designed to house 35 prisoners, but since its inception in September 1972, there have never been over 15 prisoners here at any one time. Fifteen is the present count; and I might add that out of 15 only 7 are participating in the "program"

S.T.A.R.T. consists of three levels.

Level I—Stripped cell for one week. Two hours a week exercise and two showers a week.

Level II—Receive a portion of your personal property, spend \$5 a month for commissary, work three hours a day five days a week in the makeshift "brush factory" and earn 63 cents per day, two hours a day exercise, and showers three times a week. Level II consists of six steps each lasting one month.

Level III—The same as Level II plus showers each day, eat meals outside the cell at the table, work six hours a week. The officials say that a prisoner will not say on Level III longer than three months, but it remains to be seen.

Certain staff members make up a "team" and it is up to the "team" to decide if a prisoner will be promoted or demoted. The guards constantly spy on a prisoner and record his behavior, plus test his attitude by inviting him to a game of chess, ping pong, etc. To be frank, if a prisoner doesn't "Tom" and "Jeff", he just won't make it through the "program", and as a result he will be here for the maximum two (2) year period—the same as the prisoners who have refused to cooperate.

None of the prisoners here is allowed to subscribe for his hometown paper, or any type of magazine, or purchase any type of book. Of course, the officials see to it that there are plenty of *Newsweeks*, *U.S. News and World Reports*, etc. available for the S.T.A.R.T. participants.

When I arrived here on February 15, 1973, the "team" told me, "the program has changed", but after participating in it for five days I recognized it as punish-

ment under the guise of treatment and refused to participate in it any longer. As a result, all of my personal property was taken from me with the exception of my legal material, and I was told I could have a Bible if I wanted one.

Whenever a prisoner refuses to cooperate and requests a transfer back to the prison he came from, he is placed on Level I permanently, and for little or no reason at all, other than to try to break a person's will to resist, the guards, all of whom weigh well over 200 pounds, will savagely beat him and/or strap him to his bed for four or five days. I have also seen a guard inject Thorazine into a prisoner as a means of punishment. Mail is systematically withheld in many cases. In short, the conditions here at S.T.A.R.T. are very vile.

Again, we sincerely thank you.

Peace & Power,
Forest Gustave

P.S. All of the non-participants send their regards.

Hello People

I'm glad to see you got the transcript of our discussion on the Gorz paper (*Mayday issue, ed.*) . . .

We now have a copy of the Electronic Battlefield slide show, and will be showing it here together with release of the Jason report from Berkeley SESPA. This will also be in conjunction with a conference in London on responsibility of scientists for development and maintenance of the American war effort in S.E. Asia, and what we can do to help with reconstruction in Vietnam. I hope we can get together a Science for Vietnam collective here.

Love,
Gerry McSherry,
SESPA-England

Dear Al et. al.,

Went to a reunion yesterday in support of the Greek student revolt. I don't know what has been in the U.S. papers but according to the Greek students present, the facts have been grossly distorted by the French press and the movement is much more general and enjoys more popular support than has been stated. A propos of all that is the enclosed announcement and letter (and my approximate translation). I volunteered to try to find someone in the States who would organize a campaign to circulate a similar letter (I would prefer to delete the crap about the "liberalism of the scientific world") and send it to the U.S. lecturers listed on the announcement. The French group here is sending the letter to members of the organizing committee and if there is no response

I suggested that they be confronted. Some of them signed a statement in '69 pledging to boycott Greece.

In struggle,
Ted Goldfarb
Centre National de la
Recherche Scientifique
Universite de Paris
Orsay, France

Dear Madame or Sir,

We have learned that you are planning to participate in a summer school on the Island of Spetsai (Greece).

Presently, the Greek high school and college students, supported by their teachers and professors, are revolting against the intolerable oppression imposed by the military dictatorship which has been in power since April 21, 1967. This movement is growing, thanks to the increasing support of the population, and is threatening the regime.

The French press . . . has reported the intensity of the repression practiced by the special anti-riot brigades created to replace the police who were judged to be "too soft". According to the reports, the attacks are so violent that they are said to have lead to the death of some demonstrators.

In such a situation, the existence of a summer school in Greece can be interpreted as a tacit approval of the methods used by the junta. It appears incompatible with the traditional liberalism of the scientific world that internationally renowned researchers should choose Greece as the site of their classes just at the time when the temporary masters of that country persecute or suppress their fellow citizens who are guilty of possessing the spirit of democracy.

We therefore ask you to show your solidarity with the Greek students and teachers by renouncing the organization of this school. We are also asking those invited to the conference to refuse to participate.

Respectfully,

Dear Esther, Scoop, Eric, and Tom,

The March '73 critique of Martin Willson's letter phrased the question of social responsibility in terms of "your research", "your contributions" and "your alternative". As long as questions are in terms of "your contribution" and personal morality there will be people reaching a level of awareness of the social function of science and dropping out. I've seen mathematicians become carpenters, physicists become farmers, and a physical chemist become a Buddhist, without changing the system. Dropping out may not be what the March editorial collective had in mind but it is a logical conclusion of their criticism.

The editorial collective should have tried to demystify the problem of social responsibility to reveal the conflict of class interest that it is. Weather warfare resulted from the capitalist need to control overseas markets. The logic of capitalism, not science, created weather warfare. No individual scientific worker or dropout can escape capitalist logic in North America. This form of analysis would guide Martin and others to conceive problems in terms of class and to seek

solutions in terms of building towards collective class action of his and all sectors of the working class. By collective class action I don't mean small groups working collectively in direct action. Such groups have political relevance only to the extent that they prepare the working class for struggle. I don't know what collective class action the American working class will choose. However I do believe that "The people and the people alone are the motive force in making world history" [1]. Let us aim not for 'I do science for the people' or for 'We are Science for the people' [2], but for a society in which the people do science for the people.

Yours,
Dan Adkins

[1] Mao Tse-tung, "On Coalition Government," (April 24, 1945). Selected works, Vol. III, p. 257.

[2] Steering Committee of Boston SESPA, "Who Are We," *Science for the People*, Vol. V, No. 3.

COMRADES IN THE STRUGGLE

Below we list three (out of many) organizations of comrades in the struggle to create a science for the people. We urge those of like mind to give support to these groups and their publications also.

Computer People for Peace (CPP)
291 Sterling Place
Brooklyn, NY 11238

National organization of computer workers. Publishes newsletter *Interrupt*, and holds yearly conferences on revolutionizing computer work. Has also published three booklets: *The Technological Warlords*, *Health Care is Big Business*, and *Data Banks, Privacy and Repression*.

Committee for Social Responsibility in Engineering (CSRE)
475 Riverside Dr.
New York, NY, 10027

National organization of workers in engineering. Particularly interested in on-the-job activities, suppression and misuse of scientific information, layoffs of technical workers, discontent, and military contracts. This group has an automated version of the NARMIC Automated Air War Slide Show. They publish the magazine *Spark*.

Medical Committee for Human Rights (MCHR)
2251 W. Taylor
Chicago, Illinois 60612
(Boston Chapter: 1152 Massachusetts Ave.
Cambridge, Mass. 02138)

National organization of medical and health workers, interested in deprofessionalizing health care and making it more accessible to the people. Their projects include anti-war work, patients' rights and research ethics, including psychosurgery. They want a total end to profit-making in health care, as well as an end to sex and race discrimination. Publishes *Health Rights News* and has many groups around the country. Boston MCHR has issued *The Politics of Health Care: A Bibliography*.

Teaching Science for the People

The Boston Science Teaching Group is putting together a booklet on teaching science and society issues. Genetic engineering, health care and the pharmaceutical industry, the energy "crisis", the population politics of ecology, and science and society courses are the major areas covered. Most of the material was developed for the Science Teaching Conference held in Boston this spring, but we are looking for other contributions. (Money is also needed to finance the project.) The booklet will contain our experiences teaching science in a political context, classroom-ready materials, background information, course descriptions, and annotated bibliographies. We need ideas and help in distributing the booklet. It should be ready this fall.

contact: Science Teaching Group
c/o Science for the People
9 Walden Street
Jamaica Plain, Mass. 02130

ACTION. . . GENETICS CONFERENCE!!!

A group of us in the Chicago area are beginning to plan for activities at the International Genetics Congress to be held in Berkeley, California, from August 20 to August 29, 1973. We feel that it is especially important that SESPA have an active presence there because among top geneticists are working on are the following:

1. The racism of Shockley, Herrnstein, and Jensen masquerading as the study of the genetics of intelligence.
2. The possibility of altering human genetic architecture.
3. Green revolutionaries spreading and selling new crop varieties and in the process forcing commercialization of agriculture and offering false hopes of improved living conditions.

Preliminary programs for the congress indicate that its organizers are pretending genetics and geneticists are either always beneficial to society or irrelevant to anything but the 'advance of knowledge'. We must force the congress to confront the real implications and potential destructiveness of genetics research. Although it is called an international congress, in the past it has been dominated by and is the mouthpiece of western technologically advanced countries. We are interested in making the congress truly international. We hope to agitate for invitations and visas for scientists from revolutionary socialist countries and scientists who do not represent the ruling elite from third world countries. We invite everyone interested in planning and participating in activities at the genetics congress to get in contact with us at the address below. We will serve as a clearing house for information until a more formal, representative group can be formed.

contact: David C. Culver
Department of Biological Science
Northwestern University
Evanston, Ill. 60201
312-492-3741

CHAPTER REPORT: BERKELEY

Berkeley SESPA members have been involved in diverse activities over the past few months. Many people in our group spent a lot of time with the SESPA people who had just returned from China. The China people did a lot of speaking on an itinerary set up by our China Study Group. A program on the U.C. campus featuring a talk by Judy Greenberg and the Joshua Horn film "Away With All Pests" drew about 500 people.

SESPA also sponsored a well-attended talk by Richard Lewontin called "Biology as a Political Weapon." SESPA members had put pressure on the Committee for Arts and Lectures to invite Lewontin after C.A.L. had sponsored a talk by Robert Ardrey. Ardrey had mangled biology to justify racism, sexism, imperialism, and oppressive society in general. Lewontin gave an excellent talk, attacking biological determinism, and especially the stuff put out by Jensen and Shockley, and their ilk. We are putting out a pamphlet based on the Lewontin talk, and some SESPA members are organizing around these issues for activities to be held at the International Genetics Congress to be held in Berkeley this summer.

Some SESPA people have been working on the support committee for the Oil, Chemical, and Atomic Workers strike against Shell Oil. The strike is over health and safety issues, an area in which SESPA has been involved for some time, and has been endorsed by some environmental groups. So far our work has mostly involved putting out information and speaking. We are now about to launch an attack against Shell for producing too much pollution because they are cutting corners while operating with management personnel and scabs. We are also beginning to work with some working people on some particular in-plant health issues.

Some SESPA people have also been involved in a campus group attacking recent budget cuts. We are also trying to develop our own perspective on this issue, in order to have a large impact on the many science students and scientific workers who have been severely hit by the new budget.

We would also like to note that we have sold over 2,000 copies of the Jason pamphlet, and people can still get copies by sending us \$1 per copy, or 65 cents per copy for ten or more (Box 4161, Berkeley, California, 94704). Finally, a letter by two SESPA people on the Jason appears in the May issue of *Science*.

CHAPTER REPORT: ST. LOUIS

This report was inadvertently omitted from the Mayday issue.

The major report we have to file concerns progress on the St. Louis Ecology Group's Automobile Project, the initial stages of which have been reported in earlier issues of *Science for the People* (Vol.IV, No. 3, May, 1972).

The Auto Project moved into another round of its work as we prepare our materials, first presented publicly

at the American Association for the Advancement of Science meetings in Philadelphia in December, 1972, for a book-length publication. A list of our chapter headings, recently revised, follows:

- I THE AUTO AS A SOURCE OF ENVIRONMENTAL DISRUPTION
- II THE AUTO AND HUMAN EXPLOITATION
- III PROPOSED SOLUTIONS UNDER CAPITALISM
- IV THE AUTO IN ECONOMICS AND POLITICS
- V THE SOCIALIST ALTERNATIVE

We have found that one of the most important services this work can perform is to show people how interconnected industry, government, the economic system, and environmental disruption really are in our society. We want to counter the current trend which is to attempt to solve problems of environmental disruption (auto air pollution, highway disruption of land or of urban neighborhoods, depletion of the world's natural resources, exploitation of consumers and workers) piecemeal. A lot of liberal rhetoric has been bandied about recently concerning zero economic growth, the limits to growth, the effectiveness of pollution control devices (on cars, factories). Our point is that it is possible to solve one or another single problem of environmental disruption under capitalism. But it is not possible to solve them all. It is not possible to meet people's transportation needs effectively, avoid consuming more than our share of the world's resources, avoid polluting our air and strip mining the countryside, and avoid destroying our cities' physical structure, under capitalism—especially a capitalistic system committed to the private automobile as a major means of transportation. We believe that capitalism is exploitative and necessarily expansionist by its very nature. We are illustrating these points in a variety of areas all connected with the automobile and its role in western capitalist societies (principally the U.S.).

The Auto Project Group hopes to have a complete draft of all its chapters by the end of the summer, 1973.

Several of us hold bi-weekly lunchtime discussion groups for grad students, staff (and any interested faculty) in the science departments around Washington University. Each session is devoted to a particular topic relating science and technology to political and social issues. For one session Gar Allen spoke about science education in Cuba; for another Mark Selden of the CCAS spoke about his recent trip to China, and in particular, his observations about medical care there. In a still more recent session Milton Schlesinger of the Washington University Medical School spoke about the U.S. use of chemical warfare agents in Southeast Asia, accompanied by a showing of the NLF-produced film documenting the effects of such chemicals on animal and plant life. These sessions provide a chance for those who are interested to deal with the topic of how science is misused under an unjust and exploitative economic and social system.

G.A.

LOCAL ADDRESSES FOR SESPA/SCIENCE FOR THE PEOPLE

ARKANSAS

Joe Neal
6 Beauregard Drive
Little Rock, Ark. 72206

CALIFORNIA

Len Gilbert
565 14th St.
San Francisco, Cal. 94110

- * Berkeley SESPA
Box 4161
Berkeley, Cal. 94704

Claudia Carr
Ecology Department
U. Cal. at Santa Cruz
Santa Cruz, Cal. 95060
408-429-0111 (UCSC)

Al Huebner
Box 368
Canoga Park, Cal. 91303
213-347-9992

- * Scientific Workers for
Social Action
c/o Ken Ziedman
Box 1263
Venice, Cal. 90291
213-838-0395

CONNECTICUT

Norm Klein
Hanks Hill Road
Storrs, Ct. 06268
203-429-1778

DISTRICT OF COLUMBIA

- * Washington, D.C. SESPA
c/o Lennie Moss
1771 Church St., N.W.
Washington, D.C. 20009
202-462-6930

ILLINOIS

- * Northside Chicago SESPA
c/o Bob Ogden
Dept. of Mathematics
DePaul University
2323 N. Seminary
Chicago, Ill. 60614
312-549-6246

- * Evanston SESPA
c/o David Culver
Dept. of Biological Sciences
Northwestern University
Evanston, Ill. 60201
312-492-7199

- * Science for Vietnam/SESPA
Chicago Collective
1103 E. 57th St., rm 47
Chicago, Ill. 60637
312-753-2732

MASSACHUSETTS

- * Boston SESPA/
Science for the People
9 Walden St.
Jamaica Plain, Mass. 02130
617-427-0642

- * MIT SESPA
c/o Andee Rubin
Artificial Intelligence Lab.
NE 43-815
MIT
Cambridge, Mass. 02139

MICHIGAN

John Vandermeer
2431 Darrow St.
Ann Arbor, Mich.
313-971-1165

MINNESOTA

- * Science for Vietnam/SESPA
Minneapolis Collective
1507 University Ave., S.E.
Minneapolis, Minn. 55414
612-376-7449

MISSOURI

- * St. Louis SESPA
c/o Gar Allen
Dept. of Biology
Washington University
St. Louis, Mo. 63130
314-863-0100 x4387

NEW YORK

- * N.Y.C. SESPA/
Science for the People
c/o Joe Schwartz
115 W. 15th St.
New York, N.Y. 10011
212-989-6304
- Jim Landen
700 Westover Avenue
Schnectady, N.Y. 12307
518-372-5364

- * Stony Brook SESPA
c/o Eric Entemann
Chemistry Dept.
SUNY
Stony Brook, N.Y. 11790
516-751-1071

PENNSYLVANIA

Dave Popkin
1629 Beechwood Blvd.
Pittsburgh, Pa. 15217
412-422-7954

TENNESSEE

Donald C. Mikulecky
Div. of Biophys. and Neurobio.
Meharry Medical College
Nashville, Tenn. 37208
615-327-6212

WISCONSIN

- * Madison Science for the People
c/o Joe Bowman
306 N. Brooks St.
Madison, Wisc. 53715
608-255-8554

VERMONT

Jim Mulick
Dept. of Psychology
University of Vermont
Burlington, Vt. 05401
802-656-2670 x49

AUSTRALIA

Peter Mason
School of Math and Physics
Macquarie University
North Ryde
New South Wales 2113

ENGLAND

Gerry McSherry
Flat 2
5 St. Michael's Place
Brighton, BN 1, 3 FT
Sussex, England

IRELAND

H.N. Dobbs
8 Ailesbury Grove
Dublin 4, Eire

WEST GERMANY

- * Max Planck SESPA
c/o Claus Offe
Max Planck Institut
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Riemerschmidtst. 7

*Chapter—three or more people
meeting regularly

Science for the People Buttons provoke discussion spread the word are beautiful 50 cents ea. 10 for \$4.50 50 for \$20.00 250 for \$70.00
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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)

If you are working, do you work in industry , government , university , other _____

- 2. Local SESPA chapter or other group in which I'm active:
- 3. I am enclosing money according to the following scheme: (a) regular membership—\$10, (b) indigent membership—less than \$10, (c) affluent or sacrifice membership—more than \$10, (d) completely impoverished—nothing, (e) I have paid already.
- 4. I will sell _____ magazines. This can be done on consignment to bookstores and newsstands, to your colleagues, 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.
- 6. I would be willing to provide technical assistance to community, movement, or Third World groups in the areas of:

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, 9 WALDEN ST., JAMAICA PLAIN, MASS. 02130