

FUSION

MAGAZINE OF THE ENERGY FOUNDATION
June 1979

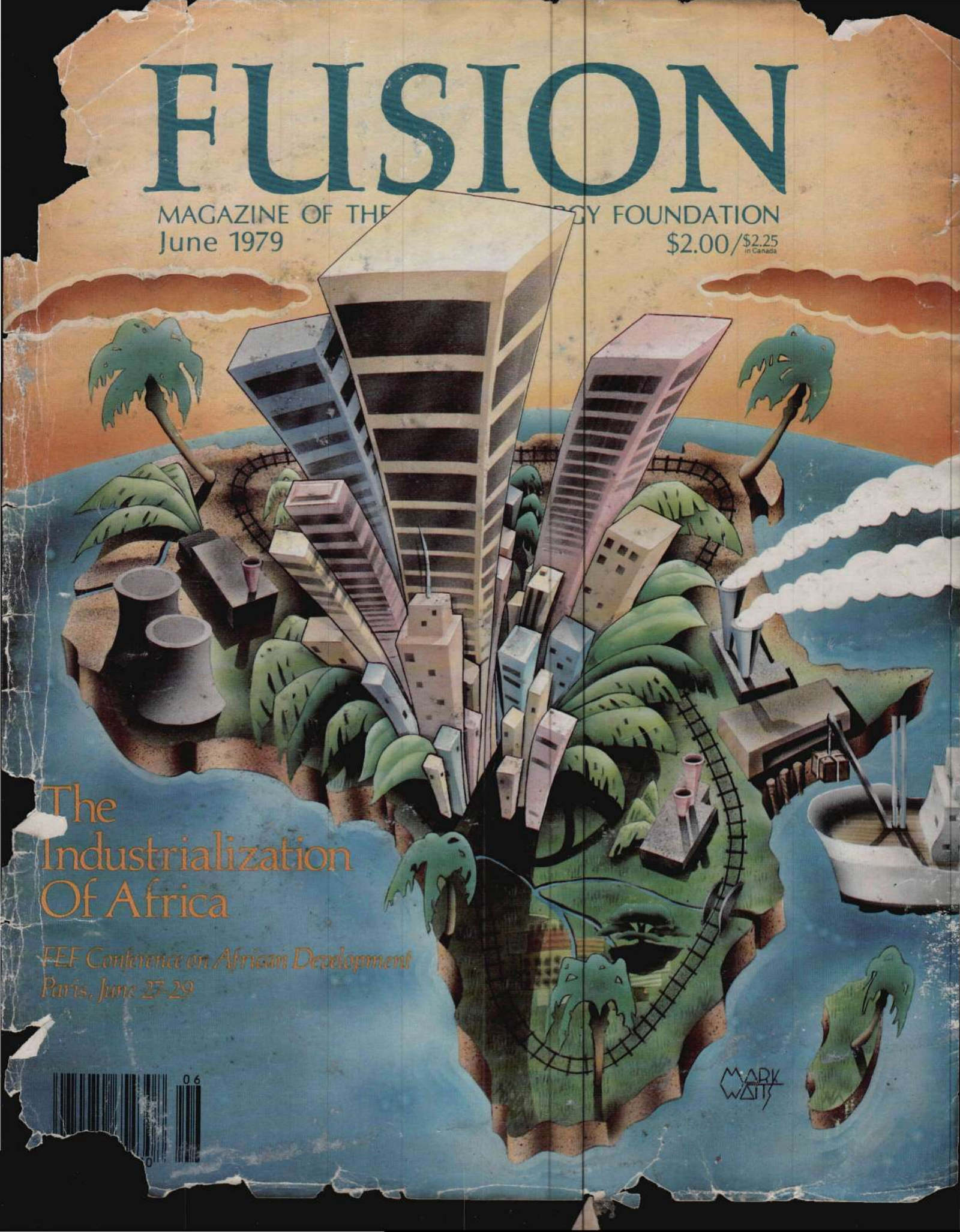
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The Industrialization Of Africa

*FEF Conference on African Development
Paris, June 27-29*



MARK
WATTS



FUSION

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Editorial



Defeating the Environmentalist Conspiracy

It must be dawning on people by now, given the current nuclear shutdowns and gas lines, that the nation's energy policy under Secretary of Energy James Schlesinger is to shut down energy. And yet, simply because Jane Fonda is cheered by a mob of potheads and zero-growthers when she calls for Schlesinger's resignation at the May 6 antinuclear demonstration in Washington, D.C., the word goes out in industry and science circles that if Schlesinger were to be removed he would be replaced by—heaven forbid—an environmentalist.

Such people don't understand environmentalism.

Environmentalism is not a lifestyle. Nor is it affection for the great outdoors, or even an irrational fear of low-level radiation. Environmentalism is the philosophy that man is a talking beast.

Consider once again the following passages from Secretary Schlesinger's own writings in his 1960 book *The Political Economy of National Security* (New York: Praeger Press):

Economics is the science of choices in a world of limited resources.... The same dualism that underlies economics underlies the nature and condition of man. For anything you have missed, you have gained something else; and for anything you gain, you lose something....

We have gone around the world spreading the "gospel of plenty," raising the level of expectations.... In the nature of things, these expectations can never be satisfied.... Despite the modification of the original Malthusian dogma over the years, the danger remains that excessive growth of population will wipe out the gains of economic progress. Any economic revolution will be shortly wiped out by a Malthusian counter-revolution and the illusion of growth.... It is unwise to overstate the importance of economic growth per se....

We must in our strategic policy return to the days before the Industrial Revolution ... prepare to fight limited wars.... We must build our military force on the exact opposite of the industrial potential notion.

That is environmentalism!

Environmentalism is not an amorphous and "decentralized" social movement spawned by the complexities of modern urban and industrial civilization. It is an ideological battering-ram that is paid for and deployed from the top down by the real masterminds of the environmentalist movement.

"What! A conspiracy theory," our earnest pronuclear friends protest. "Yes," we say. "But the trick is that it is not secret."

The Open Conspiracy

The real secret of this conspiracy is that it is conducted right out in the open. *The Open Conspiracy*, in fact, was the title of a 1928 book by H.G. Wells, one of the original open conspirators against republicanism and science.

Wells subtitled his book "Blueprints for a World Revolution," by which he meant plans for how he and his zero-growth cothinkers could control men's minds, their reproduction, and natural resources. As for the role of science, Wells described scientists as like a "swarm of marvelous bees—endowed with stings—which must be hived and cherished and multiplied by the Open Conspiracy." Today this theme of Wells and his collaborator Bertrand Russell has been fully elaborated for implementation in an ongoing series of books published by the Council on Foreign Relations under the title *Project 1980s*. These books are must reading for anyone concerned with the future of humanity, both because they so candidly discuss the larger policies underlying the present energy shutdown and because they directly detail the individuals and institutions committed to imposing "controlled disintegration" on the world in the 1980s.

The British System

Since 1974, the CFR notes, the main political threat has been the potential for an alliance between the "Hamiltonian" and "Marxian" political currents—the American System and other republics, North and South, East and West—against the British "liberal" school of thought exemplified by Adam Smith.

How does the CFR propose to counter this threat? We quote from a book by CFR cothinker Fred Hirsch, the late editor of the London *Economist*:

A degree of controlled disintegration in the world economy is a legitimate objective for the 1980s and may be the most realistic one for a moderate international economic order. A central normative problem for the international economic order in the years ahead is how to ensure that the disintegration indeed occurs in a controlled way and does not rather spiral into damaging restrictionism.

The problem therefore is not to minimize politicization in the process sense of political intervention in market outcome; it is rather to create a framework capable of containing the increased level of such politicization that emerges naturally from the changed balance of forces in both domestic economics and the international system.

We will provide a full review of the CFR Project 1980s series in a subsequent issue of *Fusion*. In the meantime, suffice it to say that the chief architects of this policy occupy almost every major cabinet position in the present administration.

Anyone who can't by now recognize that Schlesinger is exercising his crucial strategic control over energy policy in behalf of this open conspiracy is being as dumb as those American colonists who thought the tea tax was a reasonable, nonpolitical policy.

Calendar

June

3-8

ANS Annual Meeting
ANS
Atlanta, Ga.

4-6

Conference on Plasma Science
Nuclear and Plasma Science Society,
IEEE
Montreal

12-14

International Pulsed Power
Conference
Office of Naval Research
Lubbock, Tex.

18-20

American Public Power Association
Annual Conference
Seattle, Wash.

20

The Scientific and Economic
Development of Quebec
Fusion Energy Foundation
Montreal

27-29

The Industrialization of Africa
Fusion Energy Foundation
Paris
(See p. 5 for details)

June 27-July 4

High Energy Physics Conference
European Physical Society
Geneva

July

16-20

Annual Conference on Nuclear
and Space Radiation Effects
IEEE, NPS Radiation
Santa Cruz, Calif.

Readers are invited to submit calendar items.
Address correspondence to *Fusion*, 304 West
58 Street, New York, N.Y. 10019

The Lightning Rod

My dear friends,

As the Declaration of Independence asserts the right of the people to petition for a redress of grievances, I recently availed myself of a most admirable modern instrument devised for that purpose—the telephone.

The number I dialed was the so-called hotline to the Department of Energy in our nation's capital.

(Be informed that the term hotline, if it is taken to connote swiftness of response to the initiator of the call, is a clear misnomer. It may be, however, that it is intended to refer to the normal effect on the temper of the caller, in which case it is most apt.) Indeed, when the hotline finally answered, I found myself growing progressively warmer as the conversation went on:

Dept. of Energy: [in a slightly mechanical singsong, with a distinct southern drawl] D.O.E., which gas station would you like to complain about?

Franklin: Gas station? Young man, I have no quarrel with any gas station that requires a call to Washington, D.C. My difficulties are with you, sir, or more accurately, with your agency.

D.O.E.: May I have your name, sir?

Franklin: Certainly. It is Benjamin Franklin.

D.O.E.: C'mon mister, stop putting me on. Other people wanna use this line.

Franklin: Then let me state my business with dispatch. Your agency has circulated a brochure inviting all and sundry to enter a competition for funds to invent purported energy-saving devices termed, and I quote, APPROPRIATE TECHNOLOGIES.

Windmills and compost heaps are apparently considered within the purview of the competition.

My portrait is being used to decorate every page of this brochure, as a sort of trademark, I imagine.

I protest most vigorously this unlawful use of what is mine. It amounts to false advertising. I am contemplating recourse to a court of law.

D.O.E.: We are within our rights. If you are who you say, you no longer have legal standing.

Franklin: I have friends who will act for me. But let us stop this quibbling and go at the main point, sir.

My inventions and improvements were inappropriate technologies.

The Franklin stove was found inappropriate by certain competing manufacturers. The uses I found for the printing press were considered most inappropriate by George III, surely an authority you must acknowledge. And 100 years after my death, the *New York Times* still found my

researches on electricity inappropriate—Edison's electric light, they complained, was too dangerous.

In fact, sir, I would suggest that nuclear power and thermonuclear fusion represent today's sort of inappropriate technology with which I might properly be identified in spirit.

D.O.E.: [screaming] GREEDY SPECIAL INTERESTS!

Franklin: Pardon me, I don't understand.

D.O.E.: Frankly, sir, I don't either. But that's what my boss tells me to say whenever I run into difficulties with an argument.

Franklin: Well, well. Young man, I am beginning to develop some sympathy for your position. You are being grossly misinformed by your superiors.

D.O.E.: Yes sir, that's what all the other callers say. They start out about the gas stations and the lines and the high prices, and the next thing you know they're raving about a "hoax"



Letters

A WEAPON FOR FREEDOM

To the Editor:

I would like to make available to your readers the following editorial, "We Declare for Nuclear Power," from the March 13 *Independent* newspaper of Collegeville and Trappe, Pennsylvania. It is even more timely now than it was before the Three Mile Island incident.

"It is time now, not only to be sensible about nuclear power, but to be realistic.

"Because our survival as a society, a free democratic society, is at stake.

"We sound this warning cry not with hysteria but the practicality of observing what is going on in the rest of the world. The world is fast overtaking us, not only in the number of nuclear power plants but in nuclear technology, even in the oil rich nations.

"As of September 1, 1978 there

were 525 nuclear power plants either operable, under construction or on order. 324 'nukes' were being constructed in other nations around the world. 201 of these plants are in the United States AND THAT IS NOT ENOUGH....

"To stop our own nuclear construction is sheer idiocy, but to stop our nuclear research is just plain suicide. Unfortunately our nation is pursuing both of these insane objectives. It is happening here and it is engineered by a vocal misguided minority.

"Selfishly, the economic survival of our nation depends upon a cheap power supply. Unselfishly, the United States produces 75% of the world's food.

—40% of the cost of production of that food is oil

—if our farmers fail, the world will starve....

"Our economic survival is now in the balance. Indeed, the world's starving depend upon us to feed them. We cannot deny them their right to live.

"Our great nation has survived because it was willing to take chances. Risk is an essential of success. Amer-

and "that g-d---n Schlesinger." Why some of the words they use I've never heard before.

Franklin: Mmm ... do you think you could make a list and send it to me? We could compile a dictionary and pass it about. ...

D.O.E.: But I haven't got time. The phones are always ringing. ...

Franklin: Young man, I suggest you have all calls automatically transferred to the switchboards at the Capitol and the White House.

I don't know if the unfortunate fellow took my advice, but I have secured the appropriate numbers and will pass them on to you.

Congress: (202) 224-3121
White House: (202) 456-1414
I remain,
Yr. obt. svt.,



icans have never flinched or failed their duty to the world. They will not now.

"We believe the survival of mankind in a free society depends upon the survival of a strong economic and political system. To that end we believe that nuclear power is essential as a cheap energy source to bolster and support our economic and political power.

"We believe that nuclear power is safe and we endorse its use as a weapon for freedom—not just our dream of freedom but the dream of freedom that all men of good-will cherish."

John Stewart
Publisher, *The Independent*
Collegeville, Pa.

UNSAVORY LANGUAGE

To the Editor:

The other day I saw with pleasure the stand in the New York airport where your publications advertise your endorsement of nuclear power and therefore bought an issue of *Fusion* [March-April 1979]. It was my intent to become further informed

Continued on page 79.

The Industrialization of Africa

A conference sponsored by the Fusion Energy Foundation

Paris

June 27-29

at Société des Ingénieurs Civil de France, 19 Rue Blanche

Conference Program:

Session 1: Development Policy in a New World Economic Order

Session 2: Nuplexes: Seed Crystals for the Industrialization of the Developing Sector

Session 3: Development of Labor Power—

The Keystone in the Industrialization of Africa

Session 4: The Material Preconditions for an Industrial Workforce

Session 5: A Strategy for the Industrialization of Africa

Speakers include: * **Greger Ahlberg**, architect, Sweden. **Dr. Sanat Biswas**, professor of nuclear engineering and energy technology, Bengal Engineering College, University of Calcutta, India. **Jacques Cheminade**, French Ministry of Economy and Finance. **Dr. André Dodin**, nutrition expert, Pasteur Institute. **Prof. Kotto Essomé**, historian and mathematician, University of Paris. **Jean D'Herbes**, director of industrial cooperation, Compagnie Française des Pétroles. **Mme. Voahangy Rajaomah**, consultant to UNESCO; member, Société Africain de Culture. **Pierre Surbled**, African sector, Caisse Centrale de Coopération Economique. **Dr. Emmanuel Tremblay**, demographer and physician; general-secretary of the Right to Life group. **Hon. Dr. Frederick Wills**, former foreign minister, Guyana.

*Affiliations are for identification purposes only.

Registration:

Conference registration is \$20 for 1 day (100 FF), \$30 for 2 days (150 FF), and \$40 for 3 days (200 FF)

Documents:

Registrants for the full conference will receive at no extra charge the comprehensive report on African development prepared by the FEF Planning Commission. This sector by sector program, titled *Blueprint for the Industrialization of Africa*, will be available after the conference at \$40 per copy (200 francs or 80 deutschmarks).

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News Briefs



Schmidt and Giscard: Will the U.S. follow their lead?

SCHMIDT: NUCLEAR POWER OR WAR

"If the industrial countries do not develop nuclear energy, it will come to a worldwide distribution fight over shrinking energy supplies," West German Chancellor Helmut Schmidt told the European nuclear conference Foratom in Hamburg May 7. "An unjustifiable situation would develop, in which worldwide conflicts cannot be excluded, including conflicts between major powers, if the industrial countries give up the part that nuclear energy has to play in covering energy requirements," Schmidt said.

Schmidt bluntly answered the antitechnology environmentalists: "No retreat from prosperity can solve our problems or those of anyone else. No industrial country, East or West, can afford to do without nuclear energy. A general ban on nuclear energy would not only endanger technological progress and many of the preconditions for development, but also seriously jeopardize the possibilities for increasing development aid."

Schmidt concluded his presentation by proposing an international conference on reactor safety, to include the East bloc nations, that would "also work out the guidelines to training Third World nuclear power technicians."

In contrast to the Europeans' strong pronuclear stance, Lewellyn King, editor of the U.S. *Energy Daily*, told the Foratom meeting that the "nuclear option in the United States is precluded" after Harrisburg. The Foratom conference was attended by 2,300 representatives from 46 countries.

GISCARD ORGANIZING FOR WORLD ENERGY CONFERENCE

French President Giscard d'Estaing has continued to stress his commitment to join with Mexico to organize a world energy conference that will make energy the "patrimony of humanity," to use the words of Mexican President Lopez Portillo. "In the next few weeks France will be having discussions with the ministers responsible for energy questions in the oil-producing countries, to see with them what is the best way to get an international equilibrium set up in the market," Giscard announced May 4.

In the same speech, Giscard told the environmentalists that they had no support among the population. "As for nuclear energy, the French are for it, and that is a completely certain fact. They understand that France, which has no replacement for nuclear energy, must go for that energy until the year 2000, and that after the year 2000, new energies will be available."

CONGRESSIONAL ATTACK ON NUCLEAR POWER ESCALATES

The House Interior Committee voted 23-7 May 9 to require the Nuclear Regulatory Commission to enforce a six-month moratorium on the granting of construction permits for new nuclear reactors. If approved by the full House, the order would begin Oct. 1 and immediately affect six planned reactors at four sites.

Committee chairman Morris Udall remarked that the move was in response to the antinuclear march on Washington May 6 and was to assure the demonstrators that Congress would make nuclear power "safe."

McCLURE: IS SCHLESINGER CREATING A GASOLINE SHORTAGE?

Speaking in the Senate April 26, Senator James McClure demanded that Energy Secretary James Schlesinger produce hard data to justify the administration's order to shift from production of gasoline to production of heating oil. "We have here . . . a clear pattern developing on the part of the administration to create a gasoline shortage this summer which will then drive up demand and trigger the necessity for gas rationing in the U.S. this summer," the Idaho Senator said. As the supply of oil moves through the distribution



Congressman Udall's constituency in Washington May 6.

chain, "suddenly there is a greater shortage [at the consumer end] than is indicated by the reduction of supply."

McClure entered into the *Congressional Record* specific questions, letters, and other material that would facilitate an investigation into Schlesinger's role in—and reasons for—creating such a shortage.

INDIA REJECTS SOVIET NUCLEAR PLANT OFFER

The Indian government has rejected an offer by the Soviet Union for collaboration in constructing the largest nuclear plant complex in the developing sector. The proposal, made during Soviet Prime Minister Alexei Kosygin's April visit to New Delhi, was first denied by Indian government spokesmen, then confirmed, and finally rejected.

According to India's Minister of State for Atomic Energy, Sher Singh, India's "current stage of technological development" does not envision "large-scale power plants." Informed sources have said that this rejection—coming at a time when India faces the combined crisis of the oil price hike, the collapse of much of its domestic power grid, and the mismanagement of natural resources—commits the Janata government to deindustrialization.

The same sources report that elements in the Janata government are supporting a drive by V. Shankar, the private secretary to Prime Minister Desai, to unseat Homi Sethna as chairman of the Indian Atomic Energy Commission and remove from that institution the last vestiges of the nation-building tradition instilled in it by Homi Bhabha, its founder, and Jawaharlal Nehru, India's first prime minister.

MEXICAN FUSION CONFERENCE DRAWS 200

More than 200 persons attended the conference on "Nuclear Energy and Desalination: Technologies to Conquer the Desert" sponsored by the Mexican Association for Fusion Energy (AMEF) in Sonora, Mexico May 4. Among the participants were science students and faculty members from several regional universities, representatives of the Mexican government and farmers and ranchers associations, personnel from the Mexican nuclear energy institute, and city councilmen from the Sonora port of Guaymas.

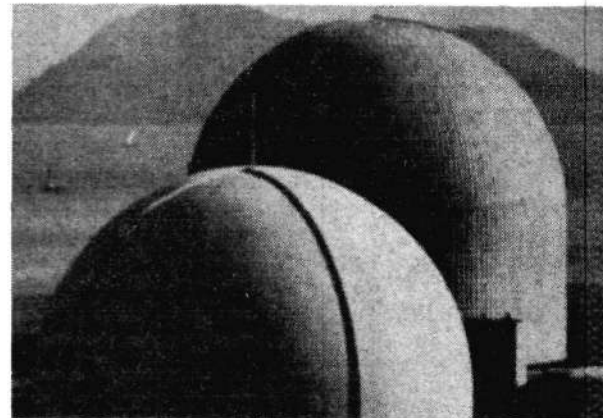
The first presentation was by Cecilia Soto de Estévez, AMEF president, on "the nuplex—the most modern agroindustry." The Mexican physicist included in her talk the outlines of an AMEF proposal to build a nuplex at the port city of Guaymas, a project that would provide a full range of benefits to the energy-poor but agriculturally rich region.

Cal Larsen, a water resources expert on the staff of the Fusion Energy Foundation in New York City, addressed the group on the "technologies of desalination, current state and future projects."

A full report on the conference will appear in the July issue of *Fusion*.

LOUSEWORT LAURELS TO NEWSWOMAN BARBARA WALTERS

This month's lousewort laurels award goes to Barbara Walters, the nationally known ABC newswoman, for her inappropriate use of technology during a panel on Three Mile Island at the annual publishers conference in New York City, April 25. When Pennsylvania Governor Dick Thornburgh, a panelist, commented that "the State of Pennsylvania was immobilized by the advanced technology of nuclear power," an FEF member in the audience asked how Thornburgh could make such an irresponsible statement at the same time that he refused to discuss the question of sabotage. In the middle of the question moderator Barbara Walters turned up the microphone to a shrill whistle to drown out the speaker.

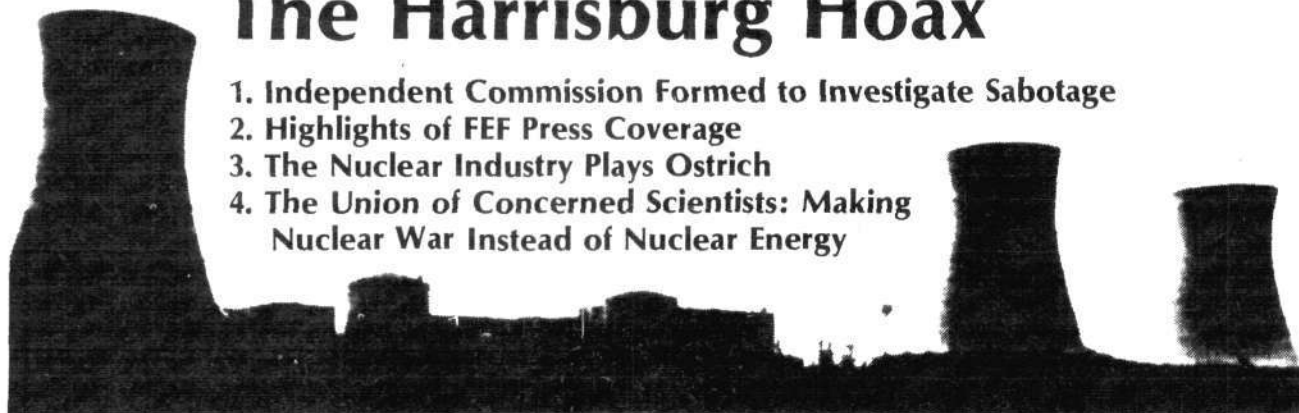


India's first—and last?—nuclear plant.



Investigating The Harrisburg Hoax

1. Independent Commission Formed to Investigate Sabotage
2. Highlights of FEF Press Coverage
3. The Nuclear Industry Plays Ostrich
4. The Union of Concerned Scientists: Making Nuclear War Instead of Nuclear Energy



1

Independent Commission Formed To Probe Sabotage

The formation of an independent Commission of Inquiry to investigate the evidence of sabotage at the Three Mile Island nuclear plant was announced at a Washington, D.C. press conference April 24.

The work of the new commission was presented to the press by Jon Gilbertson, director of nuclear engineering for the Fusion Energy Foundation, the group that has spearheaded the investigation of sabotage.

Gilbertson, who is recognized as

one of the nation's top nuclear safety engineers, announced the initiating membership of the commission (see box) and outlined the five primary areas of investigation to be undertaken by the commission.

The Key Questions

"Given that the probability of the sequence of failures at Three Mile Island being purely mechanical is about 1 part in 1 billion," Gilbertson said, "and given that the most basic operating and safety procedures were systematically violated contrary to all training and regulations, the most important question to be answered is: Was the shutdown the result of sabotage?"

"Given that the media and local officials were under top-down control of the National Security Council un-

der the just-instituted Federal Emergency Management Agency (FEMA)," said Gilbertson, "a second key question for probing is whether National Security Advisor Zbigniew Brzezinski and Energy Secretary Schlesinger expected such an incident beforehand?"

The commission will also investigate the following:

- Given President Carter's April '5 announcement of support for Schlesinger's "energy" austerity program, which includes a ban on nuclear breeders, drastic oil consumption cuts, and brute-force energy price inflation, was the plant failure and the implementation of the FEMA "crisis management," foreseen as a means of instituting unpopular energy austerity? Should Schlesinger and other top officials therefore be removed from office for gross malfeasance?

- Given the distortion by the national press and government officials of the alleged dangers of "melt-down," were these stories consciously meant to provoke the population into panic in order to permanently discredit nuclear energy development and prepare the U.S. for nuclear war confrontation through civil-defense-type conditioning?

- Finally, given the role of key antinuclear organizations, especially the Union of Concerned Scientists, in promotion of policies of shutting

More Nuclear Sabotage

The case of sabotage at the Virginia Electric and Power Company's Surry Unit Number 2 nuclear plant in Surry, Va., announced May 9, gives further credence to the FEF claim that sabotage was behind the incident at Three Mile Island.

Suspecting sabotage, Vepco officials called in the FBI to investigate. It has been determined that an individual or group of people dumped caustic soda (commonly known as lye) on new fuel elements over a period of several days. These fuel elements were stored in a highly secure area that could have been entered only by an employee with top security clearance and identification.

A Vepco official told *Fusion*, "off the record, you're probably right about the sabotage at Three Mile Island."

down nuclear plants, and given creation of "The China Syndrome" film and its public release only two weeks before the Three Mile Island incident, what is the relationship of the foundations and financial backers of these antinuclear groups to the economic policies of austerity advocated by Schlesinger et al.?

Press Coverage

Conference attendees included representatives from NBC-TV, U.S. News & World Report, States News Service, Energy User News, the National Underwriters Association, Associated Press, Mutual Broadcasting, the Los Angeles Times, the Bureau of National Affairs, and several local radio stations.

Reports of the press conference appeared in newspapers throughout Pennsylvania and New Jersey the next day, on television in Scranton and Pittsburgh, and on Mutual Black Broadcasting affiliates nationwide.

Gilbertson also gave a press conference for the commission in Harrisburg the next day that was covered widely by local press and radio and television.

Prior to the Washington press conference, an interview by ABC radio with Dr. Morris Levitt, FEF executive director, was aired several times nationally, drawing strong interest in the formation of the group.

Foul Play Affirmed

"We are finding a distinct shift in the national response to our allegation of deliberate sabotage and the role of the National Security Council's FEMA and Schlesinger in this whole situation," Levitt said. "We are getting increasing affirmation of the overwhelming case for foul play at Three Mile Island. Even sources within the Nuclear Regulatory Commission are willing to admit to us the strong possibility that such occurred, especially around the shutdown of the two backup valves 48 hours prior to the incident, something which is a 'Class A' NRC safety violation."

Levitt added that the commission will now draw on the advisory expertise of a broad layer of scientific, engineering, and counterintelligence and security expertise both inside and outside government to assist in the commission's investigation.

In a press statement May 7, Gilbertson noted that several other representatives of labor, industry, and the scientific community were seriously considering joining the commission in the near future, bringing the expected total number of commission members to 20.

"First and foremost," Gilbertson said, "the commission must assume the responsibility of being the cutting edge of the fight for nuclear power in the United States. ... At this point in time, the majority of the pronuclear institutions have crawled into their foxholes and have decided to lie low for a while. The nuclear industry, the utilities, the American Nuclear Council, the Atomic Industrial Forum, and so on have all told us that this is their policy—they're running for cover (see box for quotes).

"In our opinion this is tantamount to admitting defeat. Now is the time to stand up and fight. If we don't do it now, we're not likely to get another chance."

Stand Up and Fight

Gilbertson said that in addition to acting as a magnet for information about the Three Mile Island incident, putting pressure on the Pennsylvania state legislature to hold hearings on the incident, and promoting speaking engagements, commission members would be raising money to support commission activities.

It has also been proposed, Gilbertson said, that the commission initiate a national advertising campaign to promote nuclear power and educate the public about the facts of energy and economic growth. Such a campaign would need a minimum of \$25,000 to \$50,000 to get off the ground, he said.

The Ostrich Syndrome

Gilbertson described in some detail the ostrichlike behavior of the nuclear industry and its consequences in terms of the national press coverage on the Three Mile Island event.

There is currently a clamp on all vendors and nuclear firms who had any involvement with the construction of the Three Mile Island plant, he said. One engineer from a vendor that manufactures components for the reactor stated pointblank that all engineers and employees in his com-

Initial Members of Independent Commission

Prof. Charles Bonilla

Former Chairman
Chemical Engineering Dept. and
Former Director, Nuclear Program
Columbia University
New York, N.Y.

Emil Decembre

President
Building and Construction Council
Beaver County, Pa.

Walter Forbes

Vice President and Consultant
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Adirondack Steel Casting Corp.
Watervliet, N.Y.

Henry Hill

President
Central Labor Council
Cumberland County, N.J.

Dr. Morris Levitt

Executive Director
Fusion Energy Foundation
New York, N.Y.

Jim Rebman

Manager
Field Sales Dept.
ACME Corporation
and formerly Nuclear Navy
Fort Worth, Texas

Ira Seybold

Senior Engineer
Dosimetry Systems
Yankee Atomic Power Company
Westborough, Mass.

pany had been "ordered" to say nothing relating to the plant.

Other engineers across the country who have direct contact with colleagues connected with Three Mile Island are widely discussing the fact that sabotage must have been involved at Harrisburg—but in private. For the record, most officials at nuclear firms and utilities refer you to the *Atomic Industrial Forum* or the *American Nuclear Society* for information and opinions on Harrisburg.

As a result, Gilbertson said, the issue has been turned into an endless stream of charges and countercharges on this or that safety modification. At the same time, every one of the nine Babcock & Wilcox reactors is shut down by Nuclear Regulatory Commission order, bringing the national electric grid perilously close to brownout conditions.

Gilbertson also noted the extraordinary lack of national publicity for revelations that indicate the gross distortions in the media of what actually occurred during the Harrisburg incident. The Advisory Committee on reactor Safeguards of the Nuclear Regulatory Commission, for example, submitted a report—not adopted—to the NRC that attacked the "misinformation that was the basis for disturbing speculation on possible hydrogen-oxygen explosions in the reactor pressure vessel a few days into the accident."

The Advisory Committee rebuked the NRC for stating that an explosion was even possible. Paul Shewmon, a member of the committee, called it "dangerous nonsense to say the thing could explode"; it only served to "scare people."

In testimony before the Senate subcommittee on nuclear regulation April 10, NRC chairman Joseph Hendrie stated that "the possibility of a flammable mixture turns out to have been a misplaced concern." When Senator Domenici told Hendrie it was "very serious" that the NRC was "communicating the possibility of the worst when merely an analysis, a proper analysis of the fact would have put that in a different perspective," Hendrie replied: "I'm not sure the NRC—I'm not sure who—was issuing

the kind of drastic reports you indicated because it is now, in retrospect, a kind of jumble."

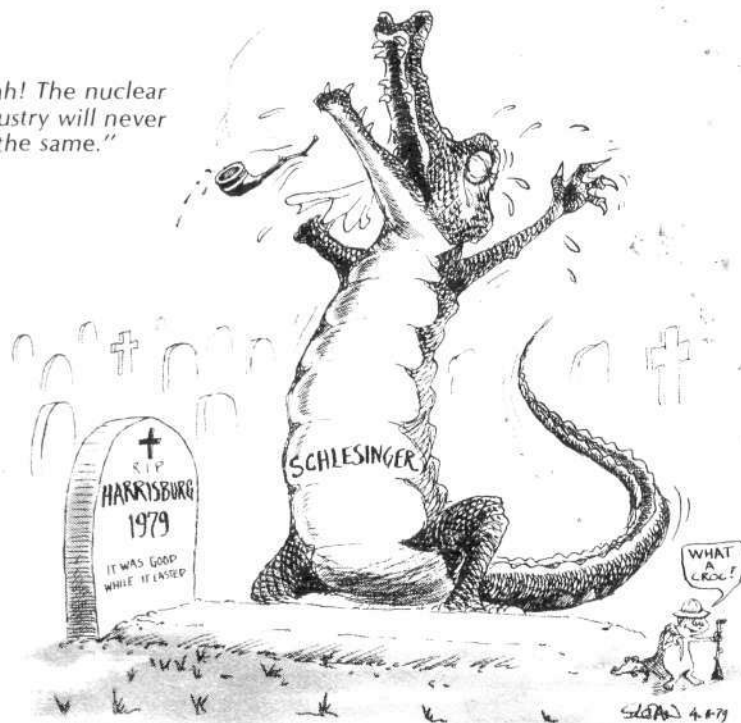
Aside from the question of whether or not NRC official Harold Denton issued the original statement, it is clear that the subsequent refutation of the danger posed has been covered virtually nowhere in the press, Gilbertson said. Why does the nuclear industry at this point fail to launch the most visible information and publicity campaign to lay the actual facts before the public? This is the real crime of Three Mile Island.

—William Engdahl

Harrisburg Transcripts Available

Transcripts of the FEF's three-hour briefing April 6 on the Harrisburg incident are available at \$50 per copy, \$20 for FEF members. The briefing was presented by staff of the Fusion Energy Foundation and the *Executive Intelligence Review*. Send check or money order to the FEF, 304 West 58th Street, New York, N.Y. 10001 or telephone (212) 265-3749.

"Wah! The nuclear industry will never be the same."



2

Highlights Of FEF Press Coverage

The Morning Call, Allentown, Pa., April 25, "Pronuclear Group Says TMI Was Sabotaged":

A pronuclear group charged yesterday that sabotage may have been behind the Three Mile Island meltdown threat and that the federal government used the incident to "discredit nuclear power."

... A spokesman for the newly formed White House Commission investigating the incident called the charges "really screwy," but said the body, holding its first meeting today, would be "looking at every line of inquiry."

The Patriot, Harrisburg, Pa. April 25,

"Pronuclear Unit Suspects Sabotage in TMI Incident" by John Helyar:

Attention on Three Mile Island thus far has been focused on the sequence of mechanical failures involved in the accident, Gilbertson contended, when what should be examined is the "accelerated, coordinated antinuclear attack taken by the environmentalist movement." He cited "weirdo" factions advocating terrorism in the name of environmentalism, which may have had plans to "infiltrate" nuclear plants in order to be in a position to do damage.

His only specific examples were the Neoamerican Church, which predicted the accident in Middletown, and Ira Einhorn, an environmental activist recently charged with murder in Philadelphia.

The Trentonian, Trenton, N.J., April 25, "3-Mile Sabotage Suggested":

... A spokesman for Critical Mass, a Ralph Nader agency which has repeatedly raised nuclear safety questions, said, "Anyone who believes that citizens, the investment community, and the Carter administration is eager to see the East Coast traumatized doesn't have any credibility."

The Times Record, Troy, N.Y., April 13, "Sabotage Possible in Nuclear Mishap," by D. R. Bahlman:

The accident at the Three Mile Island nuclear power generating plant in Middletown, Pa., was, in one of Jon Gilbertson's words, "fishy."

Gilbertson, a nuclear engineer with more than 15 years experience designing safety systems for nuclear plants, told an audience at the Rensselaer Polytechnic Institute Communications Center Thursday that the incident was blown out of all proportion by news-hungry members of the press, and he speculated that the blame for the incident will continue to fall on the operators of the plant.

It's unlikely that this thing happened by itself, or through human stupidity. These are highly trained people. They're not stupid. It's going to be very easy to say it happened because they didn't know what they were doing.

3

The Nuclear Industry Plays Ostrich

Here are some of the quotes from the nuclear industry indicating the public ostrich syndrome, the private dismay at the situation, and the incredible blindness concerning the role of Energy Secretary Schlesinger. The next issue of Fusion will report on the U.S. nuclear industry's speeches at the European Nuclear Conference.

A spokesman for the Edison Electric Institute, the lobbying arm of the nation's electric utilities, just after the Harrisburg incident:

"Our response so far has been to lay low and say nothing, hoping the whole thing blows over. ... Personally I hope that changes quickly."

The official spokesman for the Atomic Industrial Forum, May 7:

"We see the future of nuclear power as a pretty tough battle for the next year or so—until we can study or learn from what happened, especially at Three Mile Island.

"The future of nuclear power is tied to Three Mile Island. Time is needed for corrective measures. The public has to sort out the comparative risks between nuclear power and other methods of producing energy.

"The Atomic Industrial Forum will be active in informing the public about Three Mile Island and other problems."

Energy Secretary James Schlesinger at the Edison Electric Institute annual conference in Atlanta, April 11:

"I'm in favor of nuclear energy, but we must separate the weak from the strong utilities and discourage the weak ones from going into nuclear. ... [The fast breeder] won't be built nor will nuclear reprocessing be developed. These are not cost-effective until the price of uranium rises considerably."

A senior official from a Southwest utility immediately after Schlesinger's speech:

"This is a major shift. Now we've got Schlesinger on our side. This administration has finally come around on the nuclear issue."

A top Westinghouse official (with great dismay):

"The reactors now on order will be completed, then that's it. It's the end of the nuclear industry in the United States."

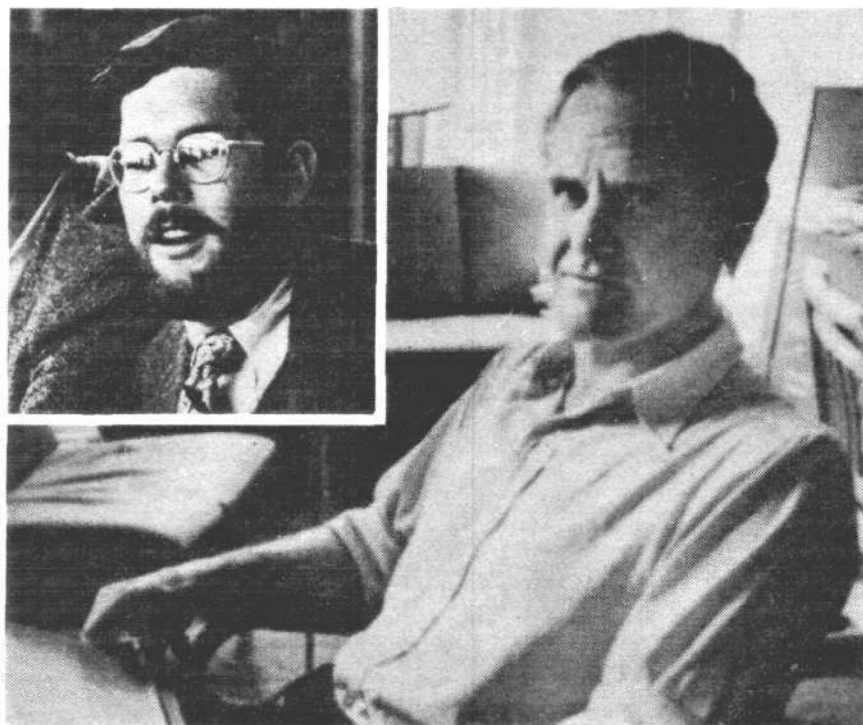
Despite the "lie low" defensive attitude of the nuclear industry and the utilities, both the majority of the public and key political figures have not capitulated to the Harrisburg hoax.

Governor William P. Clements of Texas told an ABC television special report May 1:

"The event at Three Mile Island hasn't done anything to my thinking on nuclear energy. It was an unfortunate event that was overblown. I question whether the risk was ever as great as it was depicted in the media. It was a sensation. I question whether people will be affected by the radiation in the future. My advisors, who are good scientific people, have analyzed the information."

Governor Edwin Edwards of Louisiana in a statement to *Fusion* May 3:

"I'm a strong proponent of nuclear power for this reason. I'm convinced that nuclear power can be produced cheaply and safely. ... I'm open to more nuclear power plants. Nothing that has happened in Pennsylvania has changed my mind. Nuclear energy is still needed; it's still a good thing; and everyone should feel confidence in it. Safety factors are built in, and there are continuing technical improvements."



Concerned scientists? Daniel Ford (l.) and Henry Kendall.

4

The Union of Concerned Scientists:

Making Nuclear War Instead of Nuclear Energy

Since the sabotage operation at the Three Mile Island plant in Pennsylvania, the "nuclear safety"-minded Union of Concerned Scientists (UCS) has been thrust forward as the chief advocate against nuclear power in the United States. Far from being the crusading band of activists the media portrays, the UCS was created by top Anglo-American intelligence circles to carry out their mad dream to control the world by imposing deindustrialization and depopulation in the 1980s.

This characterization is confirmed by three basic features of the UCS:

First, the main tactical objective of the UCS was to dismantle the old Atomic Energy Commission (AEC) and to set up an "independent" nuclear regulatory body riddled with anti-nuclear agents. That objective has been accomplished.

Second, the top personnel of UCS interface at numerous points with a host of Anglo-American intelligence operations on both the "left" and the "right."

Third, the UCS is a subsumed element of "arms control" mafia centered in Cambridge, Massachusetts whose strategic objective is to force the Soviet Union to accept a nuclear facedown and a new global Dark Ages.

Where Did It Come From?

The origins and mode of development of the Union of Concerned Scientists bear the ineradicable imprint of two of the worst scoundrels in postwar U.S. history: Noam Chomsky and Daniel Ellsberg. They and the UCS are tied to an operation that goes back to the anti-Vietnam-war ferment on the Massachusetts Institute of Technology campus in the late 1960s.

Groups such as SESPA—a "science for the people" group operating under the umbrella of the antiwar March 4 Movement—raised the demand that MIT break its connections to laboratories conducting military research under government contract.

At the time, MIT had more government defense contracts than any other university in the country, comprising a substantial fraction of its total budget. The two main facilities were the Instrumentation Laboratory and Lincoln Laboratory, the former concerned with missile guidance and the latter dating back to World War II radar and Manhattan Project research.

There were two objectives in going after these laboratories: first, as a wedge into a vulnerable flank that would break MIT's industry-science tradition; and second, to set up even more secret "wonder weapon" research off campus, modeled after the British aristocracy's subterranean installation at Aldermaston. The anti-military research movement also fertilized the soil out of which UCS grew from its founding at MIT in 1969.

Chomsky Negotiates

In the early 1970s the MIT brouhaha about military research peaked. Professor Noam Chomsky, who was in England at the time delivering the Russell Memorial Lectures, was called back to MIT to negotiate the conflict. (Chomsky, whose work on linguistics has been used in mind control experiments, has direct links to terrorist groups here and in Europe.) As a result of the negotiations, MIT retained Lincoln Lab but divested the Instrumentation Lab, by then renamed Draper Lab.

The "divested" Draper facility is the group of labs that has conducted research since then on advanced electronic "chips" for ultra-high-accuracy missile guidance. The guidance systems developed out of this research have reinforced Energy Secretary James Schlesinger and National Security Advisor Brzezinski's insane delusion of a U.S. nuclear first strike capability that could win a nuclear war with the Soviet Union.

The MIT antimilitary movement, moreover, was controlled directly by

Jim Morey, a former long-time Rand Corporation and Air Force Intelligence operative. Morey suddenly took up residence in the late 1960s at the Cambridge Institute, the Boston arm of the leading U.S. terrorist and social fascist think tank, the Institute for Policy Studies, which was founded in 1963 by a former staff member of the National Security Council.

Morey's colleagues at the Cambridge Institute included Gar Alperovitz, a designer of Mussolini-style economic reforms and author of the book *Atomic Diplomacy*, a coverup of Churchill's order to President Truman to A-bomb Japan. Alperovitz was also a leading figure in the March 4 Movement's teach-in on the MIT military research question, although he, like all other Institute for Policy Studies operatives, plugged directly into the intelligence networks run by the National Security Council.

Another important part of the Cambridge anarcho-fascist milieu in the early 1970s interfacing the Cambridge Institute and UCS operations was a "New Economics" project at Harvard. The present UCS Director, Daniel Ford, was a young graduate student in that program. According to the group's own bogus history of the period, Ford—who allegedly was not particularly antinuclear at the time—undertook a study of the environmental features of various energy sources, including nuclear power. Quite by accident, UCS says, Ford received, in response to requests submitted under the Freedom of Information Act, several documents that indicated the inadequacy of safety procedures for U.S. nuclear plants.

Watergating the AEC

Thus began a Watergate operation against the AEC, similar to the Ellsberg Pentagon-to-antiwar affair. For some reason, Ford sought the help of MIT physics professor Henry Kendall to verify the Freedom of Information Act disclosures. Soon Kendall applied for and received more documents incriminating the AEC and the nuclear industry.

Ford and Kendall then began meeting secretly with disaffected AEC employees and collecting "anonymous" letters describing alleged safety vio-

lations by the AEC and industry, as well as some classified documents. All these goodies helped catapult the Union of Concerned Scientists into national prominence.

This episode raises a number of very interesting questions. What officials of the AEC or other government agencies were involved in leaking secret documents to the UCS, and then protecting the UCS from prosecution as clear violators of the Atomic Energy Act's security provisions? Were the leaks of "safety violations" part of the profiling of various nuclear plants in preparation for last month's sabotage at Three Mile Island?

The UCS's smear operation was sufficient to raise a stink in Congress where representatives such as Sen. Howard Baker began to call for separating regulatory functions from the AEC, which at the time were under the Technology Division headed by Dr. Milton Shaw. With the stage thus set, numerous pronuclear figures fell into the trap of joining the call for a separate regulatory agency. This group, which included Washington state Governor Dixy Lee Ray, thought they might head off the looming attack on the nuclear industry. They

also had their own grievances against the AEC and the congressional Joint Committee on Atomic Energy for not paying enough attention to more advanced nuclear research and development.

However, this pronuclear group failed to adequately take into account two critical political aspects of the situation. One was the argument by the UCS that "special interest" industrial groups should not be permitted to influence government R&D policy under any condition. Second was that the head of the AEC at the time was none other than James R. Schlesinger. Schlesinger was playing a deception game fully consistent with his political philosophy of "lie, but don't get caught." To maintain his credibility in industrial and scientific circles, Schlesinger came out against the AEC reorganization, but at the same time he cut the basic nuclear research program and opened the door to endless environmentalist intervention by permitting a challenge to the licensing of the Calvert Cliffs nuclear plant in Baltimore, Maryland.

As planned, the reorganization went through and Dixy Lee Ray became AEC chairman. Immediately,

Mossad Implicated in Nuclear Sabotage

Two nuclear reactors destined for Iraq were almost completely destroyed April 6 when five explosive charges went off at the atomic equipment plant of the Chantiers Navals et Industriels de Méditerranée company in the Southern France town of La-Seyne-sur-Mer.

French press and government officials unofficially implied that the Israeli secret service was responsible for the terrorist act. On the day of the blasts, a French government official queried by an Israeli news correspondent replied, "I think you would know more about this than I do," according to the April 7 *Washington Post*.

The two nuclear research reactors, which were within days of being ready for shipment to Iraq, will have to be rebuilt, a task estimated to take up to 18 months. Israel has repeatedly claimed that Iraq would use the uranium that was to accompany the reactors to build its own atomic weapons.

The explosives were set by a team of three highly skilled professionals, with expert knowledge not only of explosives, but of nuclear installations, according to French reports. The team accessed the construction plant at night and immediately neutralized the alarm system with a secret code.

Ford and Kendall escalated the UCS operation and joined forces with "consumer advocate" Ralph Nader—a brand new devotee of the anti-nuclear cause—to go after Ray mercilessly on the safety question. In the subsequent course of events, Ray was forced out, and the AEC was completely reorganized: first, into the Energy Research and Development Administration, and then into the present Schlesingerian Department of Energy, along with a completely separate Nuclear Regulatory Commission. Now, after Three Mile Island, the UCS has joined forces with the "submarines" on the NRC to demand the complete shutdown of the nuclear industry.

It was, in fact, present NRC Commissioner Victor Gilinsky, a member of British intelligence's International Institute for Strategic Studies and a former colleague of Schlesinger at Rand specializing in nuclear nonproliferation, who was the architect of the NRC.

Along the way to the present state of affairs, a critical incident occurred in the mid-1970s. Several nuclear engineers quit their jobs at General Electric in California and denounced the nuclear industry and nuclear power. They were all members of a cultist "consciousness-raising" group called the Creative Initiatives Foundation, a group set up in California in the 1930s by a British national during the same period that British intelligence's hallucinogen pusher Aldous Huxley was setting up shop there. During the same period, NRC engineer Robert Pollard (see box, this page) underwent an observable change of personality and defected to the UCS.

The GE engineers were put on display in Atlanta by British intelligence's Dame Margaret Mead at a National Council of Churches meeting. This meeting passed an antiplutonium resolution to kill further development of the more advanced breeder technology and nuclear power generally. One engineer from this group subsequently became the "technical" advisor to the makers of the recent "China Syndrome" film.

Was this strange milieu the normal

stomping grounds for UCS physicist, Prof. Henry Kendall? Hardly.

Henry Kendall was a member of the elite "Jason" group of physical scientists who act as consultants on special weaponry and counterinsurgency to the Advanced Research Projects Agency of the Defense Department. During the late 1960s, supposedly antinuclear Kendall was reported in the *New York Times* to be a member of a four-man secret Jason military mission to Vietnam that was said to be surveying the battle field for tactical nuclear weapon deployment. The group, led by Dr. Richard Garwin of IBM, claimed they were working only on the "electronic battlefield."

I went into engineering because I don't want to deal with people. My idea of a good time is to go to Sears and look at the tools.

—Robert Pollard

Union of Concerned Scientists,
Former engineer for the
Nuclear Regulatory Commission

Garwin had conducted a similar military mission during the Korean war—even though he works closely with arms control circles in the Federation of American Scientists. The Federation consists of a "moderate" faction including Nobel Laureate Hans Bethe and a group of devoutly anti-Soviet Amnesty International types, such as Federation director Jeremy Stone, who are bent on curbing all scientific progress in new weapons systems.

In 1977, Kendall testified before the Senate Banking and Housing Committee hearings on civil defense and nuclear war.

He presented two reasons why the United States should not develop a civil defense program. First, civil defense exercises would be seen as provocative by the Soviet Union—this is, incidentally, the flip side of the argument used by Zbigniew Brzezinski on ABC-TV's recent series discussing U.S. military capabilities to warn against Soviet use of their existing civil defense facilities. Second and more

important, according to Kendall, this country could not support all the survivors of a nuclear war, so why save their lives temporarily through civil defense?

Exactly the same line has been pushed by Kendall's MIT physics colleague at MIT, Prof. Bernard Feld, in recent testimony before the same Senate committee. Feld is a psychotically antitechnology proponent of decentralization and solar energy who is currently the editor of the *Bulletin of Atomic Scientists*. The *Bulletin* functions as the mouthpiece for the 1940s-1950s British intelligence "Ban the Bomb" networks of Bertrand Russell, Niels Bohr, and Robert Hutchins; its current profile is environmentalist.

Kendall's selection as UCS chief scientist—despite the fact that he has no previous background in nuclear energy or social activism—his propitious receipt of useful Freedom of Information Act and secret documents, and his connections to both nuclear "wonder weapon" and antiproliferation circles are not so strange. After all, who is now the top "radical" leader of the Mobilization for Survival, the antinuclear umbrella organization that prominently includes the UCS? "Antiwar," "antinuclear" activist Daniel Ellsberg, a "former" colleague of Henry Kissinger at Harvard, "former" colleague of James Schlesinger at Rand, and a top Rand and National Security Council operative in his own right.

The Union of Concerned Scientists, in short, is nothing but a conduit and a front for the antinuclear and strategic policies of Anglo-American intelligence operatives Kissinger, Schlesinger, and Ellsberg.

Who Pays for UCS?

UCS's funding also betrays the organization's pedigree. The UCS has a salaried staff of 10 occupying a 10-room office in Cambridge that is paid for by a \$140,000 annual budget. It receives funding from the Rockefeller Brothers Fund and the Max and Anna Levinson Foundation. The Levinson Foundation, which gave UCS \$25,000 last year, is a cofounder of a variety of antinuclear operations along with the Stern Fund, which is in turn a major founder of the terrorist-con-

nected Institute for Policy Studies. The Levinson Foundation recently commissioned a study for Sen. Ted Kennedy's Joint Economic Committee by Bob Williams of Princeton's Environmental Center. The study concluded that there is no connection between economic growth and energy use.

In yet another project, the "anti-nuclear" Levinson Foundation commissioned a study of the Fusion Energy Foundation. This study was passed along to the supposedly pro-nuclear Slaner Foundation, which used the information to try to track possible FEF supporters and donors into an abortive imitation of the FEF during the past year.

Simultaneous with this nasty little operation, slanders were circulated among individuals close to the FEF that the Fusion Energy Foundation is antisemitic, while the "conservative" Heritage Foundation and William Buckley's *National Review* fulminated over the FEF's tax-exempt status.

The Slaner Foundation connects directly, through its sponsor the Kayser-Roth Corporation and Kayser's board member Disque Dean of Lazard Freres investment bank, into the so-called Nuclear Club of Wall Street. The latter has functioned as a Mossad (Israeli Intelligence) operation to maintain Anglo-American financial control by a select group of Anglo-American financiers over nuclear fuel and technology and to guarantee Israeli nuclear capabilities.

Bringing the UCS connections full circle, the numerous documented connections of the Nuclear Club of Wall Street to the Mossad include a direct interface with the producers of UCS's favorite film, "The China Syndrome." The banking house for Columbia pictures that produced the film is Allen and Company. That firm has been identified publicly as working closely with Meyer Lansky, the U.S. gangster exiled to Israel.

The UCS and its backers may do everything possible to halt the proliferation of nuclear energy, but they have no such concerns about the spread of drugs, the destabilizations of governments, or war.

—Dr. Morris Levitt

Washington

U.S., Soviets Reach Accord On Energy Cooperation

U.S. and Soviet delegations meeting in Washington, D.C. in late April reached a tentative agreement on protocol to extend the Cooperative Agreements in Energy.

The Soviet delegation, led by Academician Sheindlin, the head of the Institute for High Temperatures in Moscow, will return to the United States June 13 with P.S. Neporozhniy, the Soviet minister for power and electrification, to hammer out remaining issues and sign the extension of the agreements on joint work. The energy agreements, which do not include nuclear energy, involve research in magnetohydrodynamics, other forms of electrical power gen-

eration, coal, oil, gas, superconducting transmission, and system planning.

Originally signed in 1974 by President Nixon and N. Podgorniy, the chairman of the Presidium of the Supreme Soviet, the agreements were part of the overall detente policy of the Nixon administration. Under the leadership of Energy Secretary James Schlesinger, however, the agreements have become an area of attempted manipulation of the Soviets, with little concern for the development of advanced science and technology—the heart of the original agreements.

Beginning in discussions last December, the U.S. deputy assistant sec-

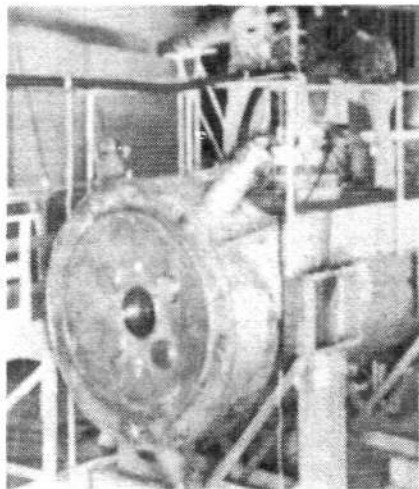
Fusion Office Loses Important Post

An important public information staff position has been eliminated from the Department of Energy's Office of Fusion Energy, DOE sources report. The post of executive assistant to the director, which had been temporarily filled by Len Arzt for the past several months, fell victim to the ongoing civil service reorganization and a conscious DOE policy of gutting competent administrators and staff from the nation's energy development programs.

Arzt, who worked as an aide to Fusion Office director Edwin Kintner, was a liaison to the fusion community and the public and helped prepare briefings and congressional testimony. When the Office of Fusion attempted to have Arzt permanently transferred from the office of the assistant secretary for environment to the Fusion Office, the DOE Personnel Office stated that the job classification in the Fusion Office had been downgraded two levels on the civil service scale.

With backup from the Office of Energy Technology, headed by Secretary Schlesinger's right-hand man, John Deutch, the Personnel Office refused to compromise on the job level change. At that point, Kintner decided to withdraw the request to fill the position, rather than have someone of lesser professional quality brought in to take Arzt's place.

retary for international affairs, Sara Jackson, began to insist that the Soviets would have to agree on cooperation in "energy forecasting" if they wanted the overall agreements to be extended. According to Washington sources, this demand was considered



This large superconducting magnet, built by Argonne National Lab in Illinois, was sent to the Soviet Union under the U.S.-Soviet agreement for use in an experimental MHD generator.

House Ctte. Restores Fusion Budget Cuts

A mark-up session before the full House Science and Technology committee April 24 restored some of the cuts in the fusion budget that had been recommended for fusion plasma theory and advanced concepts by the Energy Research and Production subcommittee last month.

Congressman Manuel Lujan, a New Mexico Republican, had characterized the recommended cuts in the fiscal year 1980 budget as "too deep" when the subcommittee gave its report, and he entered an amendment before the full committee to restore \$2.2 million of the \$8 million that had been cut. Much of this funding will go to advanced theoretical work at Los Alamos Scientific Laboratory and other national laboratories.

In addition, Congressman Kent Hance, a Texas Democrat, submitted

a provocation by the Soviets, who dislike the political game-playing that goes on in the West with constantly changing estimates of oil reserves and other resources. At the same time, Soviet and U.S. scientists expressed concern that the MHD and other high technology programs would be held hostage to this demand.

When the Soviet delegation arrived in Washington in April, however, they proposed that any cooperative work on energy forecasting should be based on the model of the successful U.S. Energy Conversion Alternatives Study, a 1976 report overseen by the U.S. Energy Research Administration, the National Science Foundation, and the National Aeronautics and Space Administration. This study compared various fossil-fuel-based technologies and concluded that open-cycle MHD would be the most efficient and cost-effective energy conversion technology for the future.

The U.S. delegation, which is mainly composed of nontechnical people who are unfamiliar with the content of the work under discussion, accepted the Soviet proposal for energy forecasting cooperation. One source

an amendment to add \$800,000 to the technology and development program in magnetic fusion, particularly for work on alternate accelerators to simulate neutron damage in the critical materials-testing program.

These two amendments were passed and approved by the full committee, which will wrap up its budget mark-up by the first week in May. The total figure for the magnetic confinement budget from the Science and Technology Committee is about the same total as the Department of Energy budget request—\$362 million—but there are different funding amounts for individual programs within each budget total.

On the Senate side, neither the authorization nor appropriations committees has completed budget mark-ups.

noted that Sara Jackson had never heard of the study in question.

The Soviets also agreed to provide data on their projected energy needs to the end of the century and their estimates of Soviet and world energy production to the year 2000.

Not agreed upon in the April meeting was the timespan for the extended agreements. The United States has been pushing to renew the agreements for three years, rather than five, while the Soviets have insisted that projects in advanced research and development must be planned on a longer time scale so that they can be completed.

During his visit, Academician Sheindlin gave a presentation on MHD, to a joint session of the Montana legislature, where the U.S. Components Development and Integration Facility for testing MHD is nearing completion.

—Marsha Freeman

Building Trades Meet Adopts No-Energy Plank

In a three-day legislative conference April 26-28, the national leadership of the Building Trades department of the AFL-CIO distributed to the 3,000 delegates a revised energy policy statement that withdraws support from fusion energy.

Although it made the Building Trades' traditional pitch for nuclear development, the document starts by supporting conservation. It also adds the formulation that nuclear power is finite and must be viewed as a transition to a solar-based economy.

In addition, Building Trades head Robert Georgine ceded ground to the antinuclear lobby over the Three Mile Island incident by repeatedly giving credence to what he called the potential dangers of nuclear power.

The Building Trades unions have had a traditional commitment to high-technology energy growth, and many dissatisfied delegates at the conference expressed the view that the fight for nuclear energy would take place at the local and regional levels if the national leadership refused to act.

International

Mexico: Energy Resources Must Serve the World

In an April 11 editorial titled "Energy to Serve the World," the Mexican daily *El Nacional* contrasts Schlesinger's nearsighted "big stick" policy with Lopez Portillo's broad vision of energy and international development. Excerpts from the editorial follow.

Mexican President José Lopez Portillo has called for state-to-state agreements and a United Nations-sponsored international meeting to make oil "the patrimony of humanity" and to develop and transfer alternate energy technology throughout the world. He will formally present his proposal to the UN General Assembly in New York Sept. 27.

The Mexicans have minced no words in defining who leads the opposition to such technology transfer. Calling for world support for the Lopez plan, the semi-official Mexican government daily *El Nacional* branded U.S. Energy Secretary James Schlesinger "myopic, arrogant, and close-minded" (see box).

After high-level talks in Paris April 25, Mexico and France constituted themselves as an international organizing committee for the proposal.

The two countries will set up a system of "permanent consultations" to jointly monitor the progress of their organizing efforts, which an official communique termed indispensable to avoid the creation of a dramatic situation that could provoke grave consequences for the world [political and economic] equilibrium."

Previously, French President Valéry Giscard d'Estaing had secured the backing of the European Community at large for the energy coordination drive.

During Giscard's March visit to Mexico, Lopez Portillo warned that "the horsemen of the Apocalypse are galloping, unless all nations are guaranteed access to energy resources and unless new energy sources—like nuclear energy—are developed." He

made his target clear: to end the international oil speculation and control exercised by the oil majors and to use energy resources as a lever for development instead of a weapon for economic warfare à la Schlesinger.

The U.S. Role

As for the United States role, the President Lopez told a U.S. interviewer in February, "For our part, we would be delighted if the most powerful country in the world presented the energy problem not as the problem of the United States, but as a fundamental factor in the rationalization of the world economy."

Given this international perspective on energy, the Mexicans have not been pleased that President Carter named as the head of the renewed negotiations on natural gas two of the Schlesinger aides who participated in the Energy Secretary's wrecking of a U.S.-Mexico gas accord in 1977. Sources close to the talks say that they are "going nowhere."

Jesus Puente Leyva, chairman of the Energy Commission of the Mexican Chamber of Deputies, told the Mexican press in late April that Mexico was participating in a new round of negotiations merely as a gesture of "courtesy and a show of good will. ... In reality, the discussion ended in 1977," he said, when Schlesinger sabotaged negotiations between Mexico and private U.S. gas companies.

Mexico's position on the gas negotiations must be seen as part of a broad counterattack against the ongoing U.S. pressure campaign to control Mexico's oil and prevent its use for in-depth industrial development, as the Mexican government has planned. Both the oil grab and the enforced ruralization are part of a widely circulated report by the investment firm Blyth Eastman Dillon and others for a North American Common Market that would allocate Mexico's resources.

In addition, a recent U.S. Treasury report defined Mexico's mammoth oil and gas reserves as a matter of "national security," and Presidential Review memorandum 41, prepared by the National Security Council, calls on President Carter to treat Mexico's oil as a U.S. strategic reserve.

—Tim Rush

Schlesinger's Energy Myopia

In an April 11 editorial titled "Energy to Serve the World," the Mexican daily *El Nacional* contrasts Schlesinger's nearsighted "big stick" policy with Lopez Portillo's broad vision of energy and international development. Excerpts from the editorial follow.

Mr. Schlesinger, with his myopia, with his arrogant and close-minded attitude, has opened many people's eyes to the important truth about our fossil wealth.

If this good gentleman had not blocked the negotiations with various U.S. oil companies, the country would have made a deal and the United States would be less worried about the possible rationing of fuel...

On the other hand, the firm and calm attitude of President Lopez Portillo has led our country to be viewed internationally with increasing respect.

For the traditionalists of the USA who wish to revive the policy of the "big stick," oil is a resource that should be at the service of the powerful countries either at low cost or through force; for those not limited with such nearsightedness, that limited resource should favor development and the welfare of all countries.

Thus, the significance of the participation of the president of our country at the United Nations to develop the Mexican thesis on the just and correct form of exploitation of energy resources.

Soviet Science and Technology Advance:

The Non-Negotiable Issue for SALT

Recent statements by the highest-ranking Soviet science and communist party officials have confirmed that the bottom line of Soviet policy for the next decade is a commitment to progress in science and industry. For the sake of the ongoing Strategic Arms Limitation Talks (SALT), the Soviets have indicated that they will compromise on several issues—on the question of Jewish emigration, for example—but not on this commitment.

Writing in the Soviet daily *Pravda*, Academy of Sciences President Anatolii P. Aleksandrov promises that Soviet science and economic development will go on with or without input from the Western countries. Unsaid but equally clear from other Soviet publications is that this development will go on before a nuclear war or afterwards.

The Soviet commitment to scientific development is exactly what U.S. policy is out to stop. Even the most outwardly diverse positions on SALT in the United States boil down to a common core: The Soviets should be restrained in this and in future agreements from inordinate technological advances. Agreement on this comes from individuals like Paul Nitze of the hawkish Committee on the Present Danger to Marshall Shulman's Soviet affairs desk at the State Department, staffed by reputed soft-liners.

The motive for this Dark Ages policy is defined by the New York Council on Foreign Relations, the well-spring of current U.S. SALT policies, in the nuclear strategy installment published as part of the Council's *Project 1980s* series. The Council looks forward to a "controlled disintegration" of the world into a prolonged decline during which nations are to be stripped of their nuclear technology through a series of disarmament and nonproliferation agreements. The development of peaceful nuclear technology would interfere with the Council's plans for "disintegration."

That the outlook of the Council on

Foreign Relations and Soviet policy are mutually exclusive is evident from reading the Aleksandrov statement and several other Soviet statements with a similar message. As the Soviets have pointed out, this clash is a fundamental source of the danger of world war, above and beyond the collection of "hot spots" in every corner of the globe, and that is why SALT is a war issue today.

Moscow's moves with respect to the Soviet economy are a barometer of Soviet strategic expectations. At the April Central Committee plenum this year, Yakov Ryabov, a key party official for the defense industry, was shifted to a government responsibility in the State Planning Commission, the institution where national growth rates and resource allocation are plotted.

Simultaneous with the plenum, a

number of articles in the Soviet and East European press advocated a higher level of energy and economic independence. Academician Aleksandrov's *Pravda* piece was one; another, a review in the East German weekly *Horizont* of socialist sector nuclear energy programs, called for a goal of 90 percent energy independence.

The Soviets have not made a final decision for retrenchment for war. Their calls for international cooperation in science and technology, such as Academician Velikhov's (excerpted here) and an April 23 scientists' appeal in *Pravda* for scientists to rally for detente and pooled international efforts in energy technology, reflect a search for paths to avoid war and an opportunity for U.S. policymakers who want to do the same.

—Rachel Berthoff

Aleksandrov:

'A Review of Soviet Scientific Forces'

The policy of preserving peace...has no reasonable alternative.

In "A Review of Scientific Forces," A.P. Aleksandrov, president of the Soviet Academy of Sciences, stresses the Soviet Union's determination to achieve independent development in science and technology in the face of the West's threat of nuclear war.

...Lenin stressed that the Soviet republic must achieve the "possibility independently to supply itself with all the main raw materials and industrial goods," and he pointed to the necessity for wide electrification of the country....

When a nuclear threat hung over the country, at the call and with the constant aid of the party, scientists and engineers of our country independently solved all the most difficult scientific and technical questions of the creation of atomic energy and nuclear weapons in the same amount of time that it took the United States, drawing on the major scientific forces of many countries.

The military bases with which the imperialists encircled our country posed new complex tasks before Soviet scientists and engineers. They accomplished a real victory, creating intercontinental missiles and thermonuclear missile weapons and thereby excluding the possibility of launching a war "safe for the aggressor" against our homeland. The enormous contribution of Soviet science to raising the

economic and defense might of our homeland greatly helped our party in its subsequent conducting of the Leninist peace policy.

Recall how during the "cold war" period aggressive circles of the West strove to unleash "preventive" war against the Soviet Union, calculating on using their temporary advantage of possessing atomic weapons, which we did not have. Western papers and magazines of those years can still be found in libraries, pointing out with arrows what routes and from what bases atomic bombers would fly to bomb the cities and industrial centers of our country! And today the same circles who strove to turn the "cold war" into a hot one, have the nerve to talk about a threat from the Soviet Union they dreamed up themselves!

Soviet scientists love their homeland and consider their primary duty to guarantee the defense might of our country on the level necessary and sufficient for the preservation of peace.

However, we are opponents of the arms race; it lowers the living standards of all peoples and increases the danger of war. With the might of modern means of destruction, a thermonuclear war would be suicidal for all humanity; therefore the policy of preserving peace... has no reasonable alternative.

Our homeland, having carried out the order of V.I. Lenin to ensure the possibility for the independent development of science and technology, created its own reliable fuel-energy complex, a diverse raw-materials base, all types of industry. There is no scientific-technological task beyond our powers.

Of course, exporting our surplus production, we buy some types of goods abroad (for example, gas pipelines and industrial equipment). This helps us to speed our forward motion in necessary areas, but is not a vital necessity for us.

The same goes for scientific-technical exchanges. They are useful to the cooperating sides, but there is no vital necessity there for our side. The threats of certain Westerners to cut off scientific ties with us, though unpleasant, do not frighten us. It seems

simply irrational to break off contacts which help to one degree or another to normalize relations, to lessen the probability of confrontation.

The mighty scientific-technical potential of the Soviet Union allows it to solve problems standing in the way of its development, and its rich natural resources ensure its needs. Our country, as experience has repeatedly shown, is able to withstand all kinds of blockades.

A completely different situation exists in various Western countries. Before our eyes the United States, which has to buy half its oil and gas abroad, is using all means of pressure against sovereign states, right up to the threat to use force to secure the uninterrupted supply of oil. A two- to three-year interruption would cause—in the United States but not there alone—the most serious economic crisis.

It is interesting that it is not a lack of fuel resources that has led to this situation—coal supplies in the United States are sufficient to supply electricity requirements for 90 years—and, furthermore, the necessary

Velikhov:

'Science Is One of The Most Universal Languages'

International cooperation of scientists is valuable for all participating countries.

E.P. Velikhov, vice president of the Soviet Academy of Sciences and one of the leaders of the Soviet fusion program, contributed an overview of Soviet scientific work in frontier areas to the Soviet daily Izvestia April 15. He included several paragraphs on international cooperation, particularly in the area of thermonuclear fusion power.

The fusion of light elements has turned out to be the hardest nut for science to crack. There has been rapid progress in this area in recent years...

atomic power could be completely developed. It is mainly the desire of the oil monopolies for maximum profits that has created this complex situation.

Throughout its history, Soviet science has tried to solve tasks that are necessary not only for our country, but for mankind as a whole.

Thus, having built the first atomic power station in the world, Soviet scientists reported on it to the scientists of the whole world at the Geneva Conference, which undoubtedly facilitated successes in atomic power. Soviet scientists undertook work on controlled thermonuclear fusion, and I.V. Kurchatov made this known openly at Harwell [England]... Many successes of Soviet science and the technical achievements of the Soviet Union gave an impulse to similar work in the West...

Our country's policy of mutually beneficial international cooperation in science and technology is dictated by noble motives and corresponds to the improvement of relations between peoples....

The next step is to demonstrate the technological feasibility of thermonuclear fusion, and the Soviet Union proposes to accomplish this through the joint efforts of countries from different continents. Planning for the international tokamak, Intor, has begun under the aegis of the International Atomic Energy Agency....

In science today, we must know the correct proportions of what we should do ourselves and what should be achieved through international cooperation and division of labor. There is no need for every single country to set up its own scientific "national economy."

International cooperation of scientists is valuable for all participating countries.... The language of science is one of the most universal languages on the planet.

IAEA Criticized

Argentina Fights Restrictions on Technology Transfer

"Argentina is ready to dispense with the technical assistance provided by the International Atomic Energy Agency (IAEA) because of the obstacles imposed by the most developed countries and the excessive restrictions on the transfer of technology," the head of the Argentine Atomic Energy Commission told a press conference there April 6. "However," Rear Admiral Carlos Castro Madero added, "the country will not withdraw from the organization."

Argentina's threat to pull out of the technological aid programs of the IAEA came as a response to newly formulated text for the IAEA "ruling principles" restricting technical aid to countries—like Argentina—that have not signed the nuclear Nonproliferation Treaty. The new text was presented by the so-called Club of London countries (those with a developed nuclear technology) in the IAEA Secretariat and was voted and approved in early April.

The new text is a "serious violation of the IAEA statutes," the Argentine semiofficial newspaper, *La Opinión*, wrote April 5. The previous text, the paper said, "in accordance with IAEA statutes did not specifically restrict aid for ... [nuclear] peaceful purposes. The statutes prohibited only military uses."

AEC head Castro Madero and other civilian and military spokesmen have insisted that Argentina's nuclear development is strictly for peaceful purposes. If Argentina refuses to sign the nuclear Nonproliferation Treaty, it is because the Club of London uses it to "restrict technological" transfer to developing countries, Castro Madero said April 3. Such restrictions, "disguised behind the praiseworthy goal

of precluding nuclear proliferation, seek to strengthen the nuclear hegemony of a few and further increase the differences between developed and developing countries."

Argentina: A Nuclear Leader

Argentina is the acknowledged leader in Latin America in nuclear development, with the only operating nuclear electricity-generating facility in Latin America. The country's achievements in the nuclear energy field are particularly significant given the severe austerity policies imposed on Argentina by the International Monetary Fund during the last three years.

Last year, the Argentine government approved a very ambitious nuclear plan that calls for nuclear self-sufficiency by the year 2000 and for a constant increase in the percentage of domestic energy consumption provided by nuclear energy. Argentina plans to build a total of six plants by 1997. The first of these, a 320-mega-

watt plant located in Buenos Aires, began operation in 1974; the second plant is a 600-megawatt reactor built by Canada's AECL that will be inaugurated in 1980 in the province of Cordoba, one of Argentina's industrial centers.

Both plants use heavy water as coolant and natural uranium as fuel, and one of the immediate goals of the nuclear development plan is to build an experimental heavy-water production plant. Although Argentina has uranium reserves estimated to exceed 60,000 tons, it still depends primarily on Canada and the United States to import heavy water. Argentina has charged that Canada has used Argentina's dependence on heavy-water imports as a political weapon to try to force the nation to sign the Nonproliferation Treaty.

The government opened up bidding April 2 for construction of the heavy-water plant as well as Argentina's third nuclear plant, Atucha II. Five countries are bidding: AECL from Canada, General Electric from the United Kingdom, KWU-Siemans from West Germany, Nira from Italy, and Sulzer from Switzerland. KWU-Siemans is believed to be a leader in the bidding because of the West German government's promotion of technology transfer without strings and the fact that the firm has a proven track record in Argentina.

—Dolia Pettingell

Saudis Plan Atomic Energy Center

The government of Saudi Arabia announced in April that it will build a nuclear reactor and fuel processing plant that will include an atomic energy center to train scientists and technicians.

Hailing the announcement, the *Saudi Gazette* said April 5: "Such a step is in line with the people's aspirations to catch up with modern technological advances. We have proved during the last 50 years that we are capable of adopting modern technologies without discarding our traditions and values. We also realize that our stability and prosperity are linked to those of the rest of the world. We hope someday that Saudi scientists will have a tangible role in spreading knowledge and technology round the world."

Another commentator in the same newspaper called the plan a "breakthrough indeed, especially for bringing up a generation of atomic scientists and specialists."

The Nuclear Story Behind the Death of Zulfikar Ali Bhutto

After more than a year of trials and appeals for clemency from virtually every world leader, the Pakistani regime of General Ziaul Haq executed the former prime minister and popular leader, Zulfikar Ali Bhutto.

The shocking murder—and murder is the judgment of most independent observers—of Bhutto is the result of many factors, both internal and external. On one level, the military regime was determined to eliminate this forceful political opponent, after overthrowing him in a coup d'état in July 1977. But there remains the question of charges made by Bhutto himself and others of an outside role in the coup and subsequent events.

In a document written in his jail cell and smuggled to the West, Bhutto identified his single greatest accomplishment as the agreement reached between his government and France for the construction of a complete nuclear fuel-cycle energy system for Pakistan. This deal was an object of great controversy, and Henry Kissinger, then secretary of state, actively intervened to block the deal on grounds of nonproliferation.

In the excerpts printed here from the Bhutto document (published by the *Executive Intelligence Review* in Jan. 1979 under the title "The Pakistan Papers"), Bhutto discusses his last meeting with Kissinger in fall 1976, in which Kissinger attempted to demand a halt to Pakistan's ambitious nuclear energy program.

As Bhutto recounted in a famous speech in April 1977 where he charged the United States with interference into Pakistan's internal affairs, it was at that 1976 meeting that Kissinger told Bhutto, "We will make a horrible example of you." The implication—drawn by many observers—is that the subsequent events in Pak-

istan were a fulfillment of Kissinger's threat.

Bhutto's fight for nuclear energy development has been obscured by the charges that Bhutto was aiming to build an atomic weapons capability, an "Islamic bomb," in response to India's explosion of a nuclear device in 1974.

Ironically, this same charge is now being thrown at the Pakistani regime, which, it has been revealed, has been secretly constructing a gas centrifuge device to produce weapons-grade uranium. The Zia regime has carried out this project with the covert assistance of firms like Emerson Electric of Britain. Supposedly, Emerson supplied high-frequency electrical inverters thinking that they were going to be used for a "textile mill" in Pakistan. Other parts came from various sources, and the expertise was supplied by a Pakistani scientist trained at the gas centrifuge uranium-enrichment plant in the Netherlands run by the Anglo-Dutch-German consortium Urenco.

The sum total is that Bhutto is dead, his real nuclear energy development program ended under heavy U.S. pressure, and a somewhat fanatic and unstable military regime is building an atomic bomb, with British and other assistance ("textile mills"?). In fact, weeks before the Pakistani bomb story broke in the United States as a result of a U.S. cutoff of aid to Pakistan, Indian sources revealed a fear that the unstable Zia regime might seek to explode a device—one all ready to go—to divert attention from its unpopular rule.

The Pakistan bomb controversy is now being used as a cause célèbre to tighten up export controls for nonproliferation reasons and to heighten the antinuclear crusade.

—Daniel Snieder



Zulfikar Ali Bhutto, former prime minister of Pakistan, was hanged April 4.

Bhutto's Fight For Nuclear Development

These are excerpts from the defense statement prepared by Pakistani Prime Minister Zulfikar Ali Bhutto to refute the charges of the Zia government that led to his death sentence. The Bhutto statement, written in his prison cell and smuggled out, has been largely blacked out of the international press. (The emphasis in the excerpts is by the author.)

WHAT ABOUT THE NUCLEAR REPROCESSING PLANT?

After three years of intense negotiations, the Nuclear Reprocessing Plant Agreement was signed between France and Pakistan in March 1976. France was fully satisfied on the safeguards.... The International Atomic Energy Commission at Vienna con-

firmly the Agreement. The United States representative on the Commission voted in favor of confirmation.... In August 1976, I rejected the counterproposals of the United States. At that time, the French Government expressed its indignation over American interference. A consistent position was taken by France on the original Agreement until 5 July 1977....

Now that it is officially admitted that the Nuclear Reprocessing Plant is lost, with or without foreign aid, Pakistan would have to unquestionably move towards steeper dependence and alien-reliance. It will be more at the mercy of those who are professionals in the art of nuclear blackmail....

I have been actively associated with the Nuclear Program of Pakistan from October 1958 to July 1977, a span of nineteen years. I was concerned directly with the subject as Foreign Minister, as Minister for Fuel, Power and Natural Resources and as Minister in charge of Atomic Energy. When I took charge of Pakistan's Atomic Energy Commission, it was no more than a signboard of an office. It was only a name.

Assiduously and with granite determination, I put my entire vitality behind the task of acquiring nuclear capability for my Country. I sent hundreds of young men to Europe and North America for training in nuclear science. I commissioned Edward Stone to build PINSTECH and laid its foundation stone in the then wilderness of Islamabad. I negotiated the agreement for the 5-MW Research Reactor located in PINSTECH. In the teeth of opposition from Finance Minister Shoaib and Deputy Chairman of Planning Commission Said Hasan, I negotiated with success to obtain from Canada the 136-MW Karachi nuclear power plant and performed its opening ceremony; towards the middle of 1976, I gave the approval for the Chashma Nuclear Power Plant. And of course, I negotiated and concluded the Nuclear Reprocessing Plant Agreement with France in 1976. Due to my singular efforts, Pakistan acquired the infrastructure and the potential of nuclear capability.

It was not a simple task to catch up the lost time in a poor and underdeveloped country like ours. When I assumed charge of Atomic Energy, Pakistan was about twenty years behind India's program. When I ceased to be Prime Minister, I believe, that at the most, Pakistan was five to six

Assiduously and with granite determination, I put my entire vitality behind the task of acquiring nuclear capability for my Country.

years behind India. If the internal opposition to the nuclear program had not come from the beginning from certain powerful Ministers and bureaucrats, I could have further narrowed, even reduced the gap.

A country does not have to be merely wealthy to possess nuclear capability. If that were the only requirement, every OPEC country would have nuclear capability. The essential prerequisite is the infrastructure. For this reason, I gave the highest priority to train thousands of nuclear scientists in foreign countries. Now we have the brain power, we have the nuclear power plant in Karachi. All we needed was the Nuclear Reprocessing Plant. Arrangements for the heavy water, the uranium and the fuel fabricating plant had been made. We were on the threshold of full nuclear capability, when I left the Government to come to this death cell.

Kissinger Blackmail

Dr. Henry Kissinger, the Secretary of State for the United States, has a brilliant mind. He told me that I should not insult the intelligence of the United States by discussing the energy needs of Pakistan, but in the same token, he should not insult the sovereignty and self-respect of Pakistan by discussing the plant at all....

It is about time the regime straightened out its priorities. I did not rig the elections but is rigging an election worse than losing nuclear capability? The sovereignty and security of the State have been mounted on the gallows. The gallows that are loved and

cherished for personal vengeance are ready for the neck of the Nation. ...

Party Funds and Foreign Help

...The events of the last twenty years have made me arrive at the unambiguous conclusion that at present the greatest threat to the unity and progress of the Third World is from coup-gemony. The era of colonialism is all but dead. Only a few places remain where colonialism has still to be buried. In those places also, the burial is at hand. The Third World has to guard against hegemony, but the best way to guard against hegemony is to prevent coup-gemony. The biggest link of external colonialism is internal colonialism, which means that hegemony cannot thrive on our lands without collaboration of coup-gemony. Military coups d'etat are the worst enemies of national unity. Coups d'etat divide and debase a free people. If there was any doubt on the subject, the events in Pakistan have shown that the people of the Third World have to primarily guard against the internal enemy, if foreign domination or hegemony is to be resisted. Coup-gemony is the bridge over which hegemony walks to stalk our lands.

PNA [the Zia party] was not supported by foreign elements out of love. An understanding was reached. The understanding was that PNA would be helped and supported financially and politically to overthrow my Government by an inspired agitation. In the first instance, the Army would take over. The ground would be cleared and the obstacles removed. After the consolidation, it would be expected that the reason for the overthrow of my Government would be fulfilled. These terms and conditions were settled finally in February 1977. *The protests over the American decisions to halt aid until the questions of the Nuclear Reprocessing Plant is settled, is not an unexpected nor a new development. It was an integral part of the coup d'etat of 5 July 1977. The PNA is expected to fulfill its part of the bargain. The dance of diplomatic words, the strong statements and editorials of the poolle press are a stunt to befool the people. ...*

National

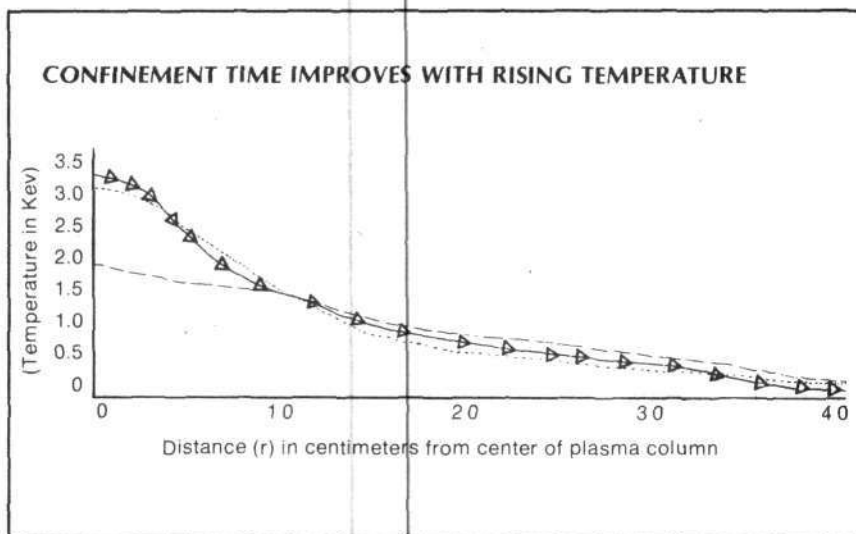
Fusion Power Coordinating Ctte. Meets at Princeton: New Fusion Advances Announced, But Schlesinger Says Go Slow

At this year's first meeting of the Fusion Power Coordinating Committee April 9-11, scores of fusion scientists from across the country tried to come to grips with the chief hurdle to fusion energy development—Energy Secretary James Schlesinger's antitechnology, antigrowth policies. The meeting, which drew about 100 scientists, was held at the Princeton Plasma Physics Laboratory in New Jersey.

Several important scientific and technical developments were reviewed at the meeting. The primary focus of the gathering, however, was the decision by the heads of the U.S. Department of Energy not to make any decision on fusion energy until 1984. In reality, this do-nothing DOE policy stems from the very active policy thrust of Energy Secretary Schlesinger: In brief, one false step and fusion is through.

Previous DOE program plans for fusion had projected that a commercial demonstration power plant could be constructed before the year 2000. The plan called for constructing an experimental power reactor by the end of the 1980s or early 1990s that would provide a testbed for checking out all the components needed for a demonstration reactor. In order to meet this schedule, design and construction of the experimental power reactor would have to begin in 1980 at the latest.

As a result of the Schlesinger go-slow policy announced in September by DOE Director of Research John Deutch, the fusion budget was frozen and all plans to move the fusion program forward were postponed until 1984. Furthermore, a new step, the engineering test reactor, was interjected into the program plan for fusion. The test reactor would be built by the mid to late 1990s at the earliest,



while the power reactor would be postponed until 2010. On this schedule, the demonstration reactor would not come on line until the 2020s.

As is the custom at FPCC meetings, the first two days were devoted to public presentations on the fusion program, followed by one and one-half days of closed-door sessions attended by the DOE Office of Fusion management, fusion laboratory directors, and a few key advisors from private industry.

In the open sessions, it is the custom to review the program of the host lab in detail. In this case, it was the Princeton Plasma Physics Lab—the largest U.S. magnetic fusion research facility, the home of the world's most successful tokamak, the Princeton Large Torus or PLT, and the site where the Tokamak Fusion Test Reactor will come on line in 1982.

Since January, the Princeton PLT has been down for maintenance and a new larger tokamak, the Poloidal Diverter Experiment or PDX, has been brought on line. In its initial operation, PDX has operated beyond specification.

An overview of magnetic fusion was presented by Dr. Harold P. Furth, head of the PPPL research department. As Furth succinctly showed, the scientific feasibility of tokamak magnetic bottles has been virtually demonstrated. Fusion ignition temperatures have been achieved with neutral-beam heating on the PLT with stable plasma operation, and successful results have been obtained from initial microwave-heating experiments.

Most important, as Dr. Wolfgang Stodiek, head of the PLT project, had detailed prior to the Furth presentation, the confinement characteristics of tokamak thermonuclear plasmas actually appear to improve with temperature. This means that the higher the plasma temperature, the more readily and efficiently a plasma can be maintained at fusion-energy-producing conditions.

Put another way, tokamaks are now thousands of times better at confining fusion plasmas than they need be in order to produce fusion energy.

The accompanying graph of PLT experimental data demonstrates the re-

relationship of plasma temperature to confinement time. The graph shows the experimentally measured temperature of electrons in the PLT, according to their position in the plasma column: Zero is the center of the plasma column and r , the horizontal axis, is the measure of the distance outwards from the center in centimeters. The triangular points along the graph are the temperatures at these positions, measured in kiloelectron volts (1 keV equals 11 million degrees Celsius). The lines represent various theoretical projections of fusion plasma behavior.

The one line that matches the measured points most closely projects that the heat conductivity, X_e , decreases with increasing plasma density, n , and temperature, T_e . Since conductivity is the inverse of confinement, the fusion plasma actually improves its energy-producing characteristics as temperature increases.

If this proves to be true of tokamaks in general, it would be the most optimistic result possible. Tokamaks would then demonstrate that they can achieve fusion energy-producing conditions thousands of times more rapidly than previously thought.

Nowhere to Go

As Furth went on to elaborate, however, despite these stupendous results, the fusion program will have to stand still for more than a decade because of the policy directives of Energy Secretary Schlesinger. After the completion of the Tokamak Fusion Test Reactor in 1982, Furth said,

"no new tokamak" of major interest will be built in the United States. Instead, everyone must wait until the mid-1990s for the completion of an Engineering Test Facility whose authorization will come sometime in 1984. Then, according to the Schlesinger plan, maybe sometime in the middle of the next century, fusion will be made commercially available.

The go-slow philosophy was underscored by several of the presentations

According to the Schlesinger plan, maybe sometime in the middle of the next century fusion will be made commercially available.

at the FPCC meeting. On the one hand, there was much discussion of only organizational structures and no content.

On the other hand, it was clear from presentations on the recent experimental successes of the fusion program that the fusion effort is scientifically and technologically years ahead of the most optimistic previous projections. For example, Princeton scientists called for immediately moving to construct a long-pulsed tokamak experiment that would both test the essential superconducting magnet technology and provide the basis for testing long-pulse reactorlike operation. Since this experiment would not actually involve deuterium-tritium fu-

sion, only hydrogen would be used, and it could be built in about five years.

One False Step

It was made excruciatingly obvious at the meeting that Schlesinger's philosophy for fusion research is that the risk of failure is inversely proportional to the time one takes to do experiments, and that success in the program, simply means a greater opportunity for risking failure. In any case, the result is that nothing is done and fusion energy development is put off for 100 years. Then, according to Schlesinger, since fusion is so far off in the future in this scheme, even the most miniscule experimental or management error provides grounds for cutting back the fusion effort. And, therefore, risk must be maintained at the lowest possible level. QED.

One would think that intelligent scientists like fusion researchers would not be fooled by such fallacious logic.

Think again. As the FPCC meeting discussions made plain, the low-risk, do-nothing perspective has become an axiomatic consideration of all fusion research program planning, with the motto "one false step and fusion research disappears." Such a controlled environment is not conducive to any activity, let alone research into the frontiers of fusion.

What will the U.S. fusion community do about the situation? Nothing, for now. The only real progress in fusion program planning derives from the progress of the proposal of Soviet Academician E.P. Velikhov to build an internationally sponsored prototype tokamak reactor, Intor, in the 1980s.

As Dr. Stacey of Georgia Tech reported on the status of planning for the Intor, working teams have been set up in the Soviet Union, Japan, and Western Europe under the aegis of the International Atomic Energy Agency. The U.S. team has set up several consulting groups consisting of the leading people in fusion engineering and physics to provide inputs on the design of Intor.

Ironically, the Velikhov proposal is now the chief vehicle for keeping the U.S. fusion effort moving.

—Charles B. Stevens

Gottlieb: 'Reevaluate Time Scale'

Dr. Mel Gottlieb, director of the Princeton Plasma Physics Laboratory's tokamak fusion program, told the fusion panel of the spring meeting of the American Physical Society April 24 that the Department of Energy's timetable for commercial magnetic fusion energy had to be sped up.

"The nation is getting impatient finding solutions to its energy and inflation problems," Gottlieb warned. "Based on recent results [in fusion experiments] all over the world, it's time to start thinking about the next device—the Engineering Test Facility."

Gottlieb expressed concern about the "question of spending large amounts of money over long periods of time to finally get to the 2020" mark on the current schedule. "Fusion demonstration is more than a curiosity," he said, and "should be done on an accelerated time scale."

Fusion News

MIT Alcator Approaches Reactor-Grade Confinement

It's been almost four years since the Alcator high-field tokamak at the Massachusetts Institute of Technology achieved the minimum conditions for fusion energy breakeven in terms of density and confinement time. At the time, this result astounded the world scientific community because the Alcator was one of the smallest tokamak experiments in the world. The Alcator still holds the record for the key parameter of density times confinement time at several times 10-trillion nuclei per cubic centimeter-seconds.

As it was excitedly reported at the Fusion Power Coordinating Committee meeting held at Princeton April 9-11, this record is about to be broken by the new Alcator experiment at MIT, Alcator C.

Intense Magnetic Fields

The Alcator was originally conceived as a basic science research device and not as a major competitor in the worldwide race to harness fusion energy. The key to its success is that it uses very intense magnetic fields to confine the hot hydrogen plasma in which the fusion reaction is ignited.

The original Alcator had a main toroidal magnetic field that reached nearly 100,000 gauss, about twice as strong as other mainline tokamaks, although the device was only about one-hundredth the size.

After the unequaled achievements of the Alcator in 1975 and 1976, the U.S. fusion program moved aggressively to follow up with a much larger experiment, about twice the size of the original Alcator, but with a main toroidal magnetic field of 150,000 gauss. This new device was called Alcator C, because it was designed and given the go-ahead while an inter-

mediate experiment, Alcator B, was still being planned.

Construction of the Alcator C experiment was completed at the end of last year, and the new power supply for bringing its magnetic field up to full strength will be completed in fall 1979. However, the Alcator C has already equaled Alcator A's achievements in shakedown experiments over the past several months even though it is running with main toroidal magnetic fields less than half its eventual full strength.

These results have been so encouraging that it is now confidently expected that Alcator C will experimentally achieve confinement parameters above 100 trillion nuclei per cubic centimeter-seconds before the new power supply is installed. This confinement parameter is often quoted as what is necessary for fusion

power reactor operation, along with a temperature of about 100 million degrees Celsius.

Alternative Heating Needed

Alcator C will not immediately achieve the requisite temperatures; to do that will require alternative heating systems, like the neutral-beam heating system successfully demonstrated on the Princeton PLT experiment last year. The Alcator team does have more than 8 million watts of microwave heating equipment from an obsolete radar system obtained last year from the North American Air Defense Command. Sometime next year this microwave system could be hooked up to the Alcator experiment. Meanwhile, techniques for obtaining fusion temperatures are being developed on the Alcator A experiment while the Alcator C is being started up.

ISX-B Reaches Record Betas

The Impurities Studies Experiment, or ISX-B, at Oak Ridge National Laboratory in Tennessee was designed to solve the one remaining major scientific question for determining whether tokamaks can reach the minimal conditions needed for demonstrating economical fusion power—plasma beta. Initial results indicate record-breaking beta values, with full confirmation expected in the near future.

Plasma beta is a measure of how efficiently a magnetic field confines a fusion plasma; it is defined specifically as the ratio of the plasma gas pressure to the pressure exerted by the confining magnetic fields. In addition to plasma beta, the ISX was designed to carry out experiments to test various methods of fueling tokamaks for reactor design.

Last year in a tour de force, the ISX-A demonstrated how sophisticated and mature the field of tokamak experimentation has become by coming up to full specification within weeks after it started operation. After a series of impurities control experiments

were successfully completed according to schedule, the ISX was converted to ISX-B at the end of 1978.

The transformation of ISX consisted of changing the shape of the plasma and adding neutral beam heaters, the same type of beam heaters that Oak Ridge developed for successful demonstration on the Princeton PLT tokamak last summer. The shape change consisted of changing the ISX plasma from a circular cross-section to a "D"-shaped cross-section. Theoretically, the "D" shape is predicted to permit higher beta operation.

Current tokamak experiments operate with betas of less than 1 percent; that is, the plasma gas pressure is less than one-hundredth the pressure of the confining magnetic field. For economical power reactors, the plasma beta must be raised to a value greater than 5 to 6 percent. At the last world fusion conference, Soviet experimenters reported betas in this range in one of their smaller tokamak experiments. Now initial results indicate that the ISX-B has achieved peak betas greater than these values.

Versatile PDX Operating Beyond Specifications

The initial shakedown of the Princeton Poloidal Diverter Experiment, PDX, was completed successfully and the experiment is already operating beyond its original design specifications.

The PDX was one of the bold experimental initiatives mapped out by Dr. Robert Hirsch and Princeton Plasma Physics Laboratory almost a decade ago, after Princeton researchers successfully confirmed the initial Soviet tokamak results. At the time,

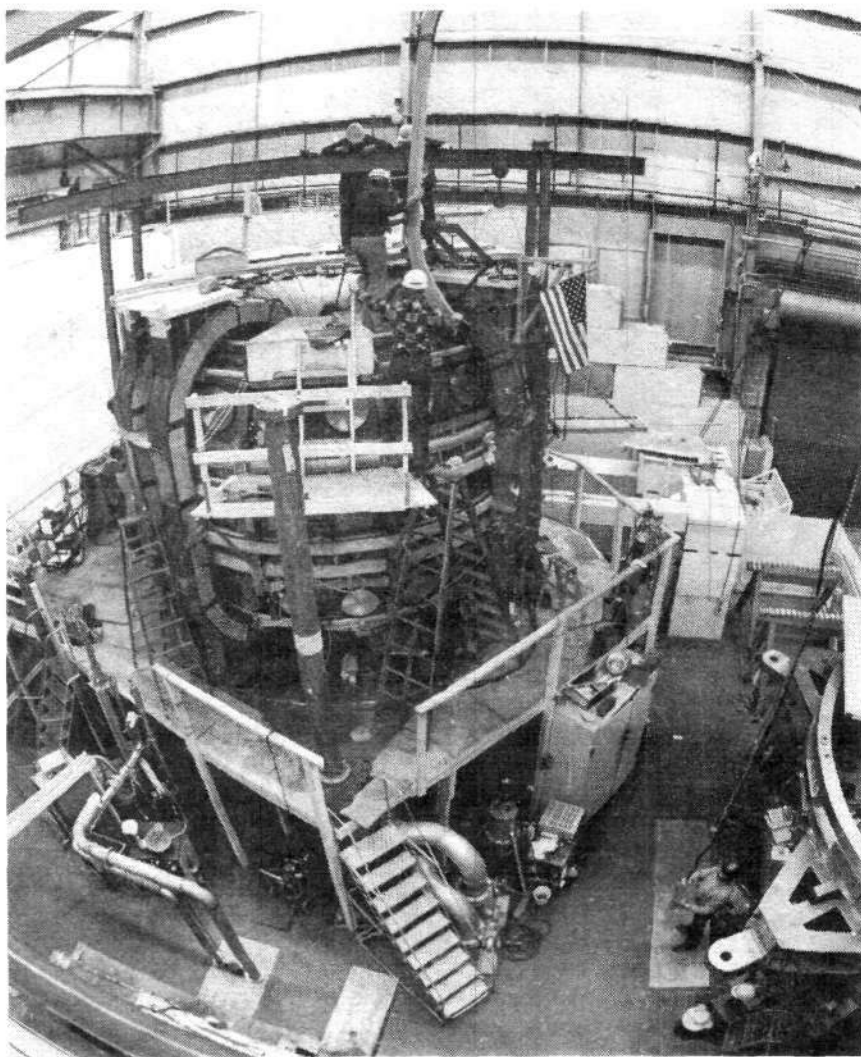
the PDX was designed to answer many unresolved questions essential to developing fusion power reactors; namely, impurity and plasma control and beta optimization. Many of these questions have since been resolved in smaller tokamak experiments. Nevertheless, the experimental versatility of the PDX experiment will not be wasted.

PDX promises to provide an essential testbed for perfecting methods of impurity and plasma control for re-

actor operation and simultaneously to provide a unique scientific capability for optimizing tokamaks for fusion power production.

At the April meeting of the Fusion Power Coordinating Committee, Princeton researchers reported that the PDX diverter, which is a "leak" in the planned confining magnetic field to permit extraction of impurities (elements other than hydrogen) from the fusion plasma, has operated successfully.

Various plasma cross-section shapes and diverter configurations will be explored in the near future. This will be followed in 1980 by adding neutral beam heating to PDX, which will permit the experiment to explore reactorlike fusion plasma conditions. Alternative types of heating using microwaves are planned for 1981, and another reactor-related experiment will involve pellet fueling of the confined plasma.



Princeton's PDX under construction

PPPL

PLT Reports Major New Achievements

The Princeton Plasma Physics Laboratory reported a number of major achievements on the PLT tokamak, the world's leading fusion experiment, at the fusion Power Coordinating Committee meeting in April.

Although the PLT is temporarily not running while a toroidal field coil is being repaired, it is expected to be back on-line soon. The field coil burned out Jan. 25, because of faults in the water-cooling and flow control system that cools the toroidal magnetic field coil. An improved water-flow monitoring system is now being installed.

The accident was not unexpected, given the complexity of the PLT experiment and the fact that the device was running around the clock for almost a year.

Here's what the PPPL reported:

(1) By discharge cleaning, titanium gettering, and carbon limiters, central

radiation in the PLT has been controlled and clean, dense plasmas obtained. The almost completely pure hydrogen plasma produced had densities of up to 10 to 20 trillion nuclei per cubic centimeter. This quality of pure hydrogen operation has also been maintained at lower densities and higher temperatures.

(2) Electrons are confined better with the neutral beam heating on the PLT than with ohmic heating (that is, heating by electrical current).

(3) The PLT has produced excellent confinement at high density with a product of density times confinement time reaching 14 trillion nuclei cubic centimeters per second.

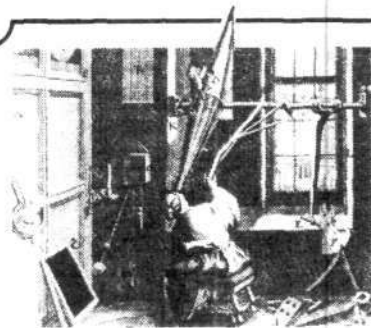
(4) Ion heating consistent with classical theoretical projections up to temperatures of 70 million degrees Celsius, well beyond the 44 million degrees needed for the ignition of fusion reactions, has been obtained with 2.4 million watts of neutral beam heating power.

Classical Theory

Classical theory predicts confinement of fusion plasmas thousands of times better than that minimally needed for power-producing fusion reactors. This most optimistic result portends the development of quite economical, small, high-power density tokamak power reactor designs. These encouraging achievements have been regularly reproduced in thousands of PLT experiments. Despite the appearance of enhanced density fluctuations, which had been predicted would indicate the development of plasma instabilities, no plasma instabilities have developed.

(5) There is a possible decrease of electron thermal (that is, heat) conduction at increased temperature. This means that the plasma electrons also are beginning to act in a classical manner.

In a word, all of the above points indicate that everything that enhances the rate of fusion energy output (density, temperature, confinement time) improves as fusion conditions are approached. In addition, microwave heating of the ions has been experimentally initiated with encouraging preliminary results.



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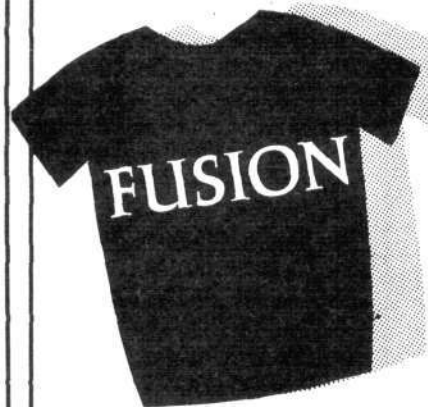
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The Disarmament Path to War

In the April issue of *Scientific American*, Kosta Tsipis and John Parmentola purport to examine some critical questions of military science strategy. Their article demands a reply—not merely because of its ignorance of science and incompetence in military matters, but more so because of the disastrous consequences of that ignorance and incompetence.

The two physicists, both associated with the Massachusetts Institute of Technology's Program in Science and Technology for International Affairs, attempt to prove that the development of particle-beam weapons would demand scientific and technological solutions "extraordinarily difficult if not altogether impossible," to quote from their conclusions.

The possibility of a directed energy-beam weapon—consisting of a beam of atomic or subatomic particles traveling near the speed of light and delivering on-target energies of tens of tons of high-explosives per second—was raised publicly two years ago. At the time, a faction in U.S. Air Force intelligence released information demonstrating that the Soviet Union was on the verge of completing the development phase of a particle beam for military application.

Tsipis and Parmentola are still protesting that what the Soviets have done is impossible, and this article, plus a long study, is devoted to proving their point.

Two-Level Argument

The authors attempt a two-level argument on scientific issues. There are two essential ingredients in a beam weapon, a power source of sufficient intensity and the ability to propagate the beam that is so produced. There are only two ways to generate the pulsed energy for the power source, they argue, chemical means and nuclear. Chemical fuels are not concentrated enough, and nuclear bombs, which are intense enough, could not be contained in a reactor for this power generation. Hence, the authors

conclude, a beam-weapon power source is impossible.

Second, Tsipis and Parmentola say, all possibilities for beam particles suffer some sort of difficulty in propagation or guidance that would rule them out for a practical beam weapon. If the particles were charged, "simple calculations" show that they could not be propagated more than a kilometer in the atmosphere or in outer space without being so diffused by instabilities or magnetic field inhomogeneities as to be useless. If the beam were to be neutral (hydrogen atoms, for example), similar problems in columnation and guidance would make it unusable as well.

Finally, the authors conclude, gamma rays (X-rays) cannot be generated with any accuracy in direction, again ruling them out.

Contradictory Evidence

Unfortunately for the group at MIT, there is ample evidence that Soviet scientists have overcome all of these problems in their construction of a beam weapon. I refer readers to other locations for more detailed discussion of some of the scientific questions,¹ but there is recent new evidence that should be noted here, which bears on precisely the two pillars of the MIT argument.

First of all, proceeding on the principle that existence proves possibility, we would be forced to conclude that a beam weapon is indeed possible.

Second, the MIT group may or may not be right that chemical explosives cannot generate the pulsed power sufficient to power a beam weapon, but their dismissal of a nuclear power source with the comment, "as for the possibility of using nuclear explosives for powering a particle-beam weapon, problems of energy containment would make nuclear weapons unsuitable," contradicts information publicly available about the solutions to exactly the problem of containment,¹ generation,² and fissile fueling.³

In addition, there is good evidence that the Soviets have done major experiments with these techniques at Semipalatinsk, the reputed site of the beam weapon,⁴ where emissions of an isotope of molybdenum in conjunction with acoustical discharges have been accounted for only by the use of a large, pulsed, fission-fueled generator.

Even more disingenuous are the authors' arguments about the impossibility of propagating a beam of any type without it quickly diffusing. The simplistic "proofs" they offer contradict Soviet and U.S. theoretical and experimental work in beam propagation over the past five years. These experiments have shown that beam interactions, like all plasmas, are characterized by highly nonlinear interactions that have the general tendency to concentrate energy spontaneously—to create *on their own* the conditions for propagation and are, in fact, self-focusing.

Phenomena like solitons (the self-bunching-up of electrical energy associated with a beam) dominate high-energy regimes of beam propagation and dramatically improve the stability and focusing characteristics of electron beams.⁵ Filamentary structures, called vortex filaments, spontaneously form in the propagation of both electron and ion beams and are responsible for a self-focusing phenomenon that, again, invalidates any of the authors' "basic laws of physics" as they try to apply them to the beam.⁶

Finally, there is the interesting possibility, which some European intelligence experts have speculated on, that the Soviet beam weapon is not really a beam at all. These experts postulate that it is bundles of particles wrapped in their own field-complex, called a *plasmoid*, whose self-generated fields would effectively shield it from deflection and distortion by the earth's field and allow controlled propagation for great distances.⁷

If we give Tsipis the benefit of the

doubt, his ignorance—for whatever reason—of the realities of beam weapon possibilities is intended to prevent a new, costly round of arms development and the destabilization of disarmament negotiations. But these are precisely the effects of attempting to retard scientific development.

As Schlesinger and many others have matter-of-factly stated, a go-slow policy on new technologies—military and otherwise—leads to the necessity of war to defend a shrinking supply of strategic resources.

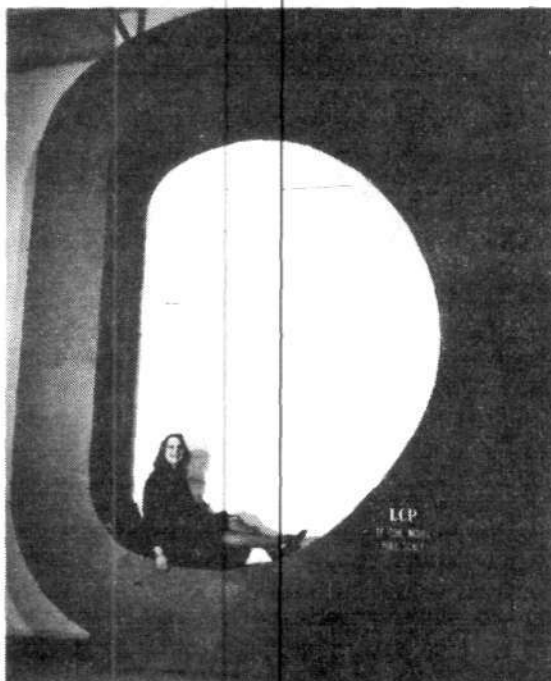
That military imperative dictates a tremendous buildup of existing arms as well as the kind of moves to militarize the economy that are implicit in the latest energy control measures.

—Dr. Steven Bardwell

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7. See especially the work of A.I. Morozov at the Kurchatov Institute in Moscow.
8. See, for example, "The Progressive Case: Aiming the H-Bomb Against Fusion," *Fusion*, May 1979, pp. 22-24.

IGC—very big in superconducting magnet systems.



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Full scale model of superconducting winding for Tokamak toroidal field coil (Oak Ridge National Laboratory Large Coil Program).

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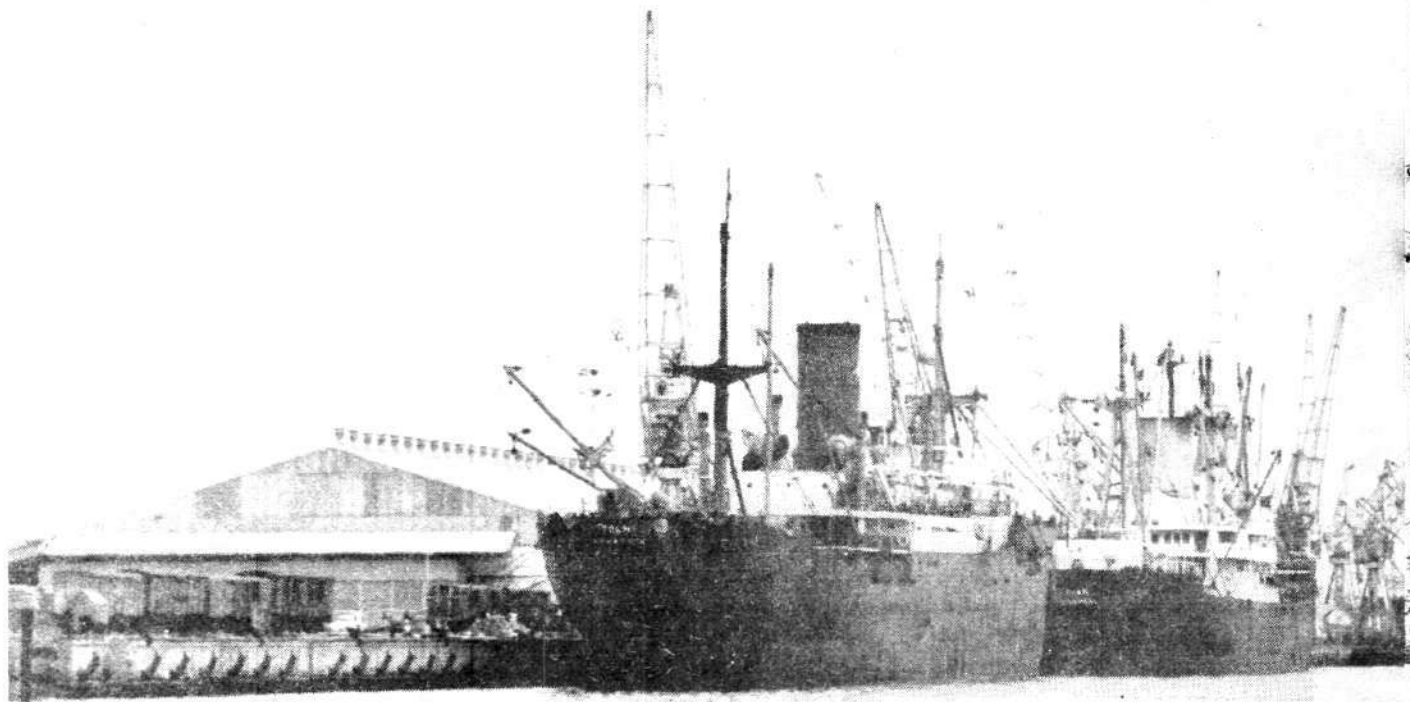
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FEF to Hold Paris Conference:

Planning for the Industrialization

The port of Ijora in Lagos, Nigeria.



The Fusion Energy Foundation has called this conference on "The Industrialization of Africa" to promote the in-depth discussions required to design a development plan that will bring the continent into the 21st century as an

industrial leader.

The need for—and the urgency of—a long-term, continentwide development program is obvious, as the article by Christopher White on the "International Monetary Fund's Holocaust in Africa" makes clear.

Fortunately, Africa's fate is not yet sealed by the genocidal policies of the IMF. In recent months, France, West Germany, and several Arab nations, in particular, have

proposed African development initiatives on a scale compatible with a global, industrial "Grand Design." The implementation of these initiatives is critical, not only for Africa's future, but for the future of the world economy. As put forward by several world leaders—including the Soviet Union's Brezhnev, French President Giscard, Mexican President Lopez Portillo, and West German Chancellor Schmidt—North-South technology transfer and cooperative agreements on energy resources are the only hope for world peace and prosperity.

The FEF has invited to this conference representatives from industry, finance, government, cultural, and research groups to discuss and debate the key questions involved in planning an effective development program for the



of Africa

United Nations

entire continent. To aid in this process, we have assembled a distinguished group of speakers and a comprehensive three-day program (see page 5 for details).

The articles in this issue are provided as background material. Like the front cover design, they are intended to challenge the usual conception of a tribal Africa and a development policy that must proceed inexorably step-by-step. Instead, we describe a massive, top-down development program that creates an elite trained in the highest level science and technology, that establishes the most advanced industry and agriculture, and that uses the core group to rapidly educate and raise the skill levels of the entire population.

The major working document for the conference is "A

Blueprint for the Industrialization of Africa" prepared by the FEF Planning Commission in Europe. This comprehensive document, termed by one of its authors "the first definitive program for Africa in 500 years," presents the history of the battle for development from the time of Malthus to the present day, an overview of the New World Economic Order, and a sector-by-sector analysis of the needs and potential for a continentwide industrial program. Both the scope of the project and the detailed analysis of manpower, infrastructure, and plant needs and potential make this an invaluable tool for any serious planner.

As the "Blueprint" describes in detail, the basic building block for any industrial development program has to be the nuplex—one or more nuclear plants surrounded by an agroindustrial complex. Only with the energy intensity provided by nuclear power will there be enough cheap and efficient energy to power the scale of industry, desalination, and mechanized farming that Africa requires. And only by substituting this technical energy for human physical labor will Africa's population be freed to develop the scientists, technicians, and labor force of the future.

For those of us in the United States, where nuclear power is under attack, the crucial role of nuclear energy in the developing sector is a sharp reminder of what the nuclear fight is all about.

The debate necessary to hammer out an industrialization program that will take into account Africa's potential began at a preconference sponsored by the FEF in Paris April 20 on "Industrial Development and the Renaissance of Africa." About 70 persons attended, mostly African students, to hear Professor Kotto Essomé, an historian at the University of Paris, and Jacques Cheminade, an official from the Ministry of Economics and Finance and long-time FEF collaborator.

Both speakers challenged the popular cultural relativist views of Africa. Africa's tribal atomization is a recent phenomenon—a "racist fiction"—imposed by the colonialists and the slave traders, Essomé said in his discussion of "the fiction of tribal fatalism." In contrast, Essomé described the city-building tradition in Africa prior to the 16th century. Attacking ethnologists like Malinowski, he put forward a view of African universalism.

Cheminade's talk described the nuplex concept and how it could be financed through the European Monetary Fund. Then he discussed the British colonialist philosophy of divide and conquer and its French companion ideology.

The most animated discussions took place after Cheminade attacked "Negritude," the black is beautiful concept popularized by Franz Fanon, as a "white invention" imposed on black Africa by the same British imperialists who developed tribalism to control the continent.

The outcome of the intense debate was a commitment on the part of most of the audience to attend the June 27 FEF conference to continue the discussion—and to come up with a solution.

As most participants agreed, the decisions made in the next few months will determine whether the decades of the 1980s and 1990s are characterized by industrial development in the Third World—or war.

The IMF's Holocaust in Africa

by Christopher White



THE WORLD BANK'S 1978 *World Development Report* notes, with no hint of remorse, that what it calls Africa's "high" population growth rate of 2.5 percent a year "has been checked so far by high mortality rates associated

with the high incidence of communicable diseases, especially gastric diseases, malnutrition, and poor traditional midwifery and weaning practices."

The situation is so bad, another report notes, that in Zaire more than half the children born will die before they are five years old.

Other official reports are equally bleak. According to the United Nations Food and Agriculture Organization, headquartered in Rome, 17 African nations now face severe food shortages as a result of drought, floods, and war. The FAO considers that Ethiopia, Nigeria, Mali, Chad, and Ghana are the most critical cases.

The FAO also reports that during the 1970s the average annual rate of increase in food production in Africa has been 1.3 percent. This compares with the average annual 2.7 percent rate of increase registered during the 1960s (see Table 1). In terms of per capita consumption of food, these figures mean that in the 1960s food consumption increased by an official 0.3 percent per person, against a decline of 1.4 percent during the 1970s. This is on a continent in which 75 percent of the 380 million population is still tied to the bestial routines of subsistence agriculture.

The World Bank's euphemisms and the FAO's officially understated statistical surveys, drawn from the reports of governments that themselves cover up the reality of their national predicaments from outside as well as internal scrutiny, give a mere glimpse of what is really going on.

Africa's population is on the verge of extermination through the combined effects of famine, plague, war, and so-called natural disasters, such as the droughts that have gripped West Africa, the Horn, and southern Africa and the floods that have followed drought in such countries as Mozambique. Africa's population is being submitted to genocide through economic warfare directed against that continent as a whole by the group of London-centered international financial and mineral corporations whose activities are protected by the international enforcement program of the International Monetary Fund and World Bank.

Those organizations have relentlessly pursued a policy of bringing about what they call a New Dark Age. They have aimed at reducing the world's population by between 1 and 2 billion people during the decade of the 1970s. The World Bank and the International Monetary Fund have not yet herded significant populations into gas ovens to complete that program; they have simply deprived the bulk of the world's population, the developing-sector population, of the right to secure on a continuing basis the means for their existence as human beings. They have deprived the developing sector of access to the material instrumentalities in the form of imported technologies and capital goods that alone can enable those populations to provide for their, and our, posterity.

It might be thought that the institutions coordinated and fronted for by the IMF and the World Bank have sought merely to protect the aboriginal quality of life of the natives in the Third World by protecting them from the dangers and perils of modernization. Such a view, often voiced by the environmentalists, is the same kind of bestiality as the policy of the IMF.

Africa is being forced back into stone age conditions, and under such conditions Africa will support only a stone-age population level.

The Expendable Fourth World

Africa is not alone in this. That continent, like parts of Asia and Central and Latin America, was scheduled for extermination during the course of 1975 when the World Bank's Robert McNamara drew up a list of what were then known as Fourth World countries. These were countries considered to be so poor in terms of raw material resources, so backward and primitive, that they should no longer have access to outside sources of credit, capital goods, and so on. Bangladesh and Kampuchea (Cambodia) typify the group as a whole. Nothing could be done for such countries except to leave them to starve.

The World Bank is explicit on this: "Even if large-scale and highly commercialized farms were more efficient, which is not always the case, there are reasons for preferring a strategy which emphasizes the growth of small-holder production."

The growth of this small-holder production has created the conditions documented here.

In this respect Africa merely represents a level of brutal bestiality that has been imposed on the Third World as a whole. If this policy is allowed to continue it will not

simply be the human race in Africa or the human race in other parts of the Third World that is thrown onto the scrap heap of the Four Horsemen of the Apocalypse. Humanity as a whole is at stake in the Third World. These are the policies that have brought the world to the brink of general thermonuclear war by forcing the adoption of military-style regimes on some countries, political destabilizations combined with economic warfare on others, such as Iran and now Turkey. The enforced return to barbarism in the Third World is the principal cause of world war right now.

The Destruction of African Agriculture

The IMF has destroyed Africa by destroying African agriculture. In doing this its policymakers have vastly magnified the effects of the persistent droughts that have affected all parts of the continent since the early 1970s. The IMF has throughout insisted that only labor-intensive modes of agricultural production are permissible for developing sector countries. This approach is applied to both food production and cash crops, which are supposedly foreign exchange earners. Toleration of this outrage has brought about the present potentially genocidal catastrophe.

The IMF's viciously enforced approach has brought about a fundamental shift in even backward Africa's economy. Prior to the rigorous enforcement of this policy, most African nations were in fact food exporters, even if on a small scale. Like Zaire, they marginally maintained a division of labor that could support a surplus-producing internal economy. There are now *no* African food exporters (if coffee production is excluded).

Instead, the previously undeveloped backward agricultural profile has been shifted into a full-scale subsistence economy with certain large-scale slave labor plantations thrown in, as in Tanzania, for the production of cash crops for export. The African peasant is now forced to clear land with slash-and-burn methods to produce food for himself and his village. Internal markets have been destroyed. Along with this there has been a shift in emphasis away from encouraging production of grains into the production of carbohydrate source root crops, such as cassava.

At the same time that Africa's productive capacity is being destroyed, the foreign debt and the ratio of debt service to debt have grown astronomically (see Table 2).

Such a policy profile has been applied in South Africa



United Nations

In Zaire, more than half the children born will die before they are five years old. Here, a medical aide examines a famine victim in the Congo.

Table 1
AFRICAN FOOD PRODUCTION: A DOWNWARD SPIRAL

Index of Per Capita Food Production
for Selected African Countries
1966-1975

	Average	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
	1961-65										
Tanzania	100 (\$24)	111	99	100	99	102	102	103	98	86	95
Angola	100 (\$26)	101	103	103	105	103	94	87	94	87	67
Zambia	100 (\$8)	122	187	81	85	92	110	157	113	135	125
Zaire	100 (\$24)	109	111	114	120	122	111	108	111	115	111
Rhodesia	100 (\$31)	97	92	85	90	79	93	103	77	102	92
S. Africa	100 (\$68)	96	121	100	101	101	113	115	93	114	104
Nigeria	100 (\$47)	94	88	83	102	96	94	96	89	92	93
Guinea	100 (\$17)	93	101	108	109	106	108	107	107	104	104
Mali	100 (\$18)	92	95	82	96	87	80	66	60	67	65
Niger	100 (\$27)	100	107	98	99	96	88	73	52	71	64
Ethiopia	100 (\$34)	100	101	103	102	100	99	91	87	87	77
Sudan	100 (\$24)	90	106	87	100	106	109	100	92	103	104
Kenya	100 (\$23)	99	105	100	95	95	90	97	95	95	96
AFRICA*	100	96	97	97	101	98	98	97	91	95	94

* excluding Egypt, South Africa

Source: USDA, *Indices of Agricultural Production in Africa and the Near East, 1956-75*. There is evidence that the USDA figures overstate actual production.

Taking the 1961-1965 average per capita production as 100, the figures here show the regression of African agriculture before the wars of the last three years and the current famine. In many African countries, per capita food production this year may be down as much as 20 percent below the 1975 averages.

The figures are for production of food, including estimates for the subsistence sector and without regard for imports or exports. The dollar amounts are farmers' prices in constant dollars of the 1961-1965 period for the worth of per capita annual food production.

and Rhodesia as well as in the black African countries where the IMF has been permitted freedom of access. The consequences of the policy pursued since 1973-1974 and with relentless ferocity since 1975 are now beginning to surface with a vengeance in depleted soil fertility, crop failures, plant disease, and the genocidal emargination of the millions of rural inhabitants thrown into such subsistence forms of agriculture.

The overall climate created by the IMF and the World Bank has created the economic conditions for the launching of wars of extermination of populations, in the same way as happened with Adolf Hitler. In Africa, as elsewhere, these wars are directed at the destruction of states such as Angola, Mozambique, and Ethiopia that have operative defense treaties with the Soviet Union. Thus, Africa has increasingly been destabilized since 1973-1974 by a succession of local wars whose purpose has been to strengthen the hands of the institutions for which the IMF is the international cover. This has been accomplished by destroying the educated leaderships of entire nations and by wrecking economic and transportation infrastructure such that resources potentially available for an alternate development-centered program are progressively destroyed.

South Africa

According to unofficial estimates, South Africa's corn crop will be two-thirds of the 1977-1978 tonnage. The shortfall follows a period of mounting austerity against farmers in South Africa. Threatened are the more than 10 million inhabitants of the so-called homelands. These are

primarily small-plot, tribal subsistence farmers, who have been shut off completely from access to outside credit and supplies since Harry Oppenheimer of the Anglo-American Corporation elliptically announced that they would be eliminated three years ago. Now reports of mass-scale starvation are beginning to trickle out from relief and church organizations, as are reports of conflict between the subclans of the various tribes. The homeland population was scrapped at the same time that South Africa went into negotiations with the IMF.

Now, according to a white paper published during the week of April 2, the South Africa government of Prime Minister P.W. Botha has declared its readiness to act as a "marcher lord," policing the southern African region, while Egypt polices the north. It plans for a mobile strike force capable of hitting deep into black Africa, and the creation of a South Africa-controlled "coprosperity sphere" in the region.

The white paper defines the enemy not only as "Marxist influence"—read, Angola and Mozambique—but also as "increased political, economic, and military pressure" from the West. It foresees increased isolation for South Africa and, therefore, the necessity of developing a self-sufficient military industry not only in basic equipment such as small arms, armor, and artillery, but also in advanced military electronics and other "advanced technological fields."

The paper notes that the permanent core of the South African defense force, now around 65,000 men, has been expanded by a full third in the last two years. Its "total

national security strategy" to counter the "total threat" of a "total onslaught" includes an increase in naval defense, an overhaul of the air defense system, and the creation of a parachute brigade—"a quick reaction force,"—which may be called up and deployed at short notice for both "conventional" and "semiconventional" actions. Such a brigade would probably be 4,000 to 5,000 men, with light armor and artillery, that could take on any army in southern Africa.

The paper proposes "a geo-economic community of interests" and the "concept of mutual defense against a common enemy." What this means is that South Africa's repeated raids against Angola and Zaire are no short-term maneuvers for the Namibia negotiations, that South Africa is abandoning its undertaking to refrain from military support of the "blackface majority rule" government in Rhodesia, and that it fully intends to set up a puppet government in Namibia.

Rhodesia

In Rhodesia, there will be a 30 percent shortfall in the corn harvest for white farmers this year. There will be a 100 percent complete wipe-out for the black farmers on the tribal trust lands. One million of Rhodesia's cattle herd died last year. By the end of next month, another 1 million head out of a total herd of 6 million head of cattle will be dead. The head of Rhodesia's African Farmers Union, Gary Magadzire, recently warned that over 90 percent of Rhodesia's registered black farmers face bankruptcy. The government has outlawed certain kinds of production because of the war. However, the profile of Rhodesia's economic policy matches that shaped for South Africa by the IMF.

The Catholic Institute for International Relations reports on the situation as follows: "The breakdown in administration has led to the closure of food stores, clinics, and mission hospitals. Immunization programs against common disease such as measles and tuberculosis have been abandoned. So too have programs to combat endemic diseases such as malaria and bilharzia. Cattle dipping has been stopped in a number of areas. ... The situation is in large part due to the government's insurgency campaign. With stringent curfew regulations and martial law in 85 percent of the country, the tending of crops and cattle is drastically curtailed.

Zambia

In Zambia the corn crop will also fall 30 percent short. Zambia has had no foreign exchange earnings from its major raw material asset, copper, since the third quarter of 1973. Corn has been exported as a cash crop instead of being fed to Zambian cattle or to the populations.

The country went to the IMF in 1975. Since that time the area of the country under agricultural production has increased, but the amount of food produced has declined. The amount of food consumed by the population has dropped 10 percent on a per capita basis. In 1978, President Kenneth Kuanda was forced by the IMF to implement a Cambodian-style enforced ruralization program.

Tanzania

Tanzania likewise: Between 1974 and 1975, Tanzania's labor-intensive development model, *Ujamaa*, collapsed after a series of disastrous harvests. Certain of the country's collectivized lands were turned back into private plantations under their original owners. In the meantime, Tanzania is totally dependent on outside supplies of food to maintain a margin for the survival of its population.

Angola and Mozambique

Food production in Angola is now at approximately 50 percent of the levels reached in the years before the 1975 war. The South African-backed UNITA guerrillas are keeping Angola's Benguela railroad closed.

In Mozambique, where economic activity has been continuously disrupted by Rhodesian military strikes

Table 2
THE AFRICAN DEBT BURDEN: THREE EXAMPLES

Country	Year	Balance of trade		Debt service due (in millions of dollars)	Ratio of debt service to foreign exchange (%)
		Total	debt		
Sudan	1970	NA	293.7	33.3	NA
	1971	NA	309.1	46.3	NA
	1972	6.9	329.4	48.8	13.5
	1973	1.0	376.9	54.5	12.4
	1974	-305.4	723.0	58.5	16.6
	1975	-518.1	941.7	93.0	21.2
	1976	-426.1	1,292.1	119.7	21.6
	1977	-398.6	NA	184.0	27.8
	1978		2,500.0 [†]	224.9	30.0
	1979			228.6*	
	1980			219.6*	
	1981	NA	NA	229.1*	
1982			197.5*		
1983			181.2*		
Zaire	1972	112.2	541.1	61.1	8.0
	1973	258.4	860.5	93.0	9.0
	1974	469.4	1,292.2	189.1	13.6
	1975	80.8	1,650.9	153.6	17.8
	1976	320.6	2,170.0	119.8	13.8
	1977	476.9		378.4	37.1
	1978			453.9*	50.0**
	1979			448.3*	
	1980	NA	NA	459.3*	
	1981			385.2*	
	1982			357.2*	
	1983			309.7*	
Zambia	1970	NA	547.8	54.4	NA
	1971	NA	534.6	71.8	NA
	1972	81.4	559.6	85.3	11.3
	1973	401.9	568.9	346.5	30.0
	1974	421.6	679.6	77.7	5.5
	1975	-327.9	957.2	76.5	10.2
	1976	228.0	1,184.3	86.5	19.8
	1977	77.4	1,270.0	185.4	
	1978			211.0*	
	1979			210.5*	
	1980	NA	NA	176.8*	NA
	1981			128.9*	
1982			112.9*		
1983			109.1*		

* World Bank projections

** estimate, *Euromoney* (Feb. 1979)

[†] estimate

Sources: *International Financial Statistics*, March 1979; *IMF World Debt Tables* (World Bank); *Euromoney*, Feb. 1979

The debt burden for the three African governments shown here includes foreign public sector debt and private and public sector loans to the public sectors. The figures do not include private-sector borrowing. Foreign exchange includes earnings from exports, earnings from foreign investments, and loan income.

against transportation infrastructure, storage depots, and farms, the situation is again critical.

Zaire

In Zaire the situation is so critical that the *Baltimore Sun* warned Feb. 10 that "three million hungry Zaireans may turn on the 30,000 well fed Europeans," in the capital city of Kinshasa. Average wages in Kinshasa are \$30 a month, sufficient to buy one week's food. A loaf of bread could be bought for \$7.39 last year against \$2.29 the year before. Cassava, the staple root crop source of carbohydrate, was \$0.96 a kilogram in 1977, \$3.57 in 1978.

Zaire has approximately 25 million inhabitants.

In Bas-Zaire to the west of Kinshasa, drought has created famine conditions worse than those that prevailed in Ethiopia in 1973. At least 500,000 lives are immediately threatened.

In Kivu province in the east of the country, food riots and marauding bands of pillagers are reported. This is a food-producing area. Doctors, unable to do anything, have evacuated.

In Shaba province, the mineral production center, unemployment is now calculated at 80 percent. Infant mortality in the first five years is at 50 percent; malnutrition and the diseases of malnutrition run rampant. Now the IMF has demanded that Zaire further cut its health and education programs by another 50 percent.

At the time of its independence in the early 1960s, Zaire was a food-exporting country. It had 80,000 miles of roads and an internal economy. It now has 12,000 miles of roads. There was no seed available for the beginning of the planting season this year. The IMF refuses to allow gasoline or spare parts to be imported for the country's run-down truck fleet. Food that is successfully grown inside the country cannot be transported to consumers.

Horn of Africa

Some countries do not even merit mention on the United Nations Food and Agriculture Organization's "critical list" of African countries facing severe food shortages. These include Ethiopia, Nigeria, Mali, Chad, and Ghana.

In the Horn of Africa, the IMF refuses Sudan the credit lines to complete the ambitious agricultural development program begun in the early 1970s. Sudan could produce enough food on its own, if that program were to be adequately capitalized, to feed the whole of Africa.

During the war in Ethiopia, locust extermination programs were stopped. Mulugetta Bezabih, director-general of the Desert Locust Control Organization for Eastern Africa, has warned that the swarms can no longer be controlled with the resources available in the area. Immediately threatened are Ethiopia, Somalia, Sudan, Djibouti, Kenya, Tanzania, and Uganda. If not destroyed, the swarms will pass through western Africa and move through the Arabian peninsula into the Indian subcontinent. The United States, Britain, other countries, and international agencies have been asked to help. None has bothered to reply.

West Africa

West Africa is imminently threatened with descent into a holocaust like that of Zaire. Its resources, human and otherwise, have been depleted by the long-standing drought in the Sahel countries, which has lowered water levels throughout the region's river systems while exacerbating problems of food supply. Again, the IMF has accelerated the process of decay. Ghana's "Operation Feed Yourself" has destroyed that country's advanced agricultural sector and reduced overall food production 16 percent since 1973. In Nigeria, "Operation Feed the Nation" has produced an annual official 0.5 percent increase in food production. The population growth rate of 3.0 percent offsets that.

Turning the Situation Around

The results of this policy in Africa can of course be matched comparably by examples from elsewhere in the world. It is now necessary that concrete steps be taken to turn the situation around. Africa as a whole can be saved, and can therefore become a precedent-setting case for the kinds of East-West, North-South cooperation policies that will pull the rest of the world through with very little input.

Take the Sudan, for example. Thus far the IMF's policies of preventing the slated agricultural modernization of that area from taking off have been supported by Saudi Arabia, Kuwait, and by the Europeans. Here the IMF has embargoed all new development projects until the debt incurred on existing ones has been paid off. This has emphatically included the construction of the Jongelei Canal through the Sud, which would double water throughput in the region. If the Europeans and the Saudis were to change that policy of stupidity, Sudan would shortly become the granary of Africa. This would provide the margin to get other longer-term, larger-scale projects off the ground in the western and southern sections of the continent.

Transportation lines, road and rail, must be reopened in Zaire and southern Africa. German and Italian efforts to rebuild Zaire's collapsed infrastructure must be supported. Such efforts, though marginal, may save the continent as a whole. To refuse that is to reaffirm one's complicity in genocide.

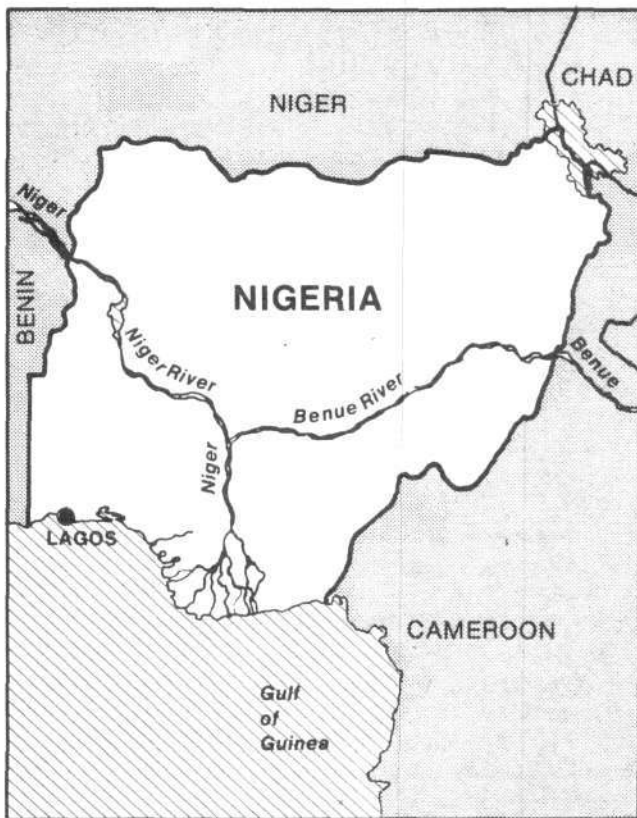
But toleration of a continued role for the International Monetary Fund and the World Bank is not a simple economic question. It is political. There is no economic reason why the state powers that have formed the European Monetary System as a war-avoidance measure cannot, together with the Soviets, the Lopez Portillo government of Mexico, Saudi Arabia, and Iraq, simply push the IMF aside and make the coordinated credit and capital goods supply facilities available that will enable the Third World to develop.

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United Nations

A Program for Nigerian Development—Key to Africa's Future



Above, 1967 construction on the Kainji Dam on the River Niger in northern Nigeria. Nigeria's chief power source, the dam also improves passage to the sea and controls flooding.

In contrast to the "share the poverty" prescriptions of the World Bank, the International Monetary Fund, and their cothinker groups, this bold proposal for African development thinks big. Development must come from the top down, training a critical cadre group at the very highest levels of science and technology who will then train others—a process that will guarantee an advanced population within two generations.

The high-technology nuplex system is the basic industrial building block for development, and the mechanization of agriculture must at the same time feed the nation and free up an adequate supply of urban workers to learn the skills necessary for a modern agroindustrial complex.

Finally, a development program that really intends to develop Africa must involve a massive inflow of investment funds. As the proposal demonstrates, unless there is large-scale initial funding, the country being developed will be unable to generate the profit necessary to pay its creditors and to continue the process of development.

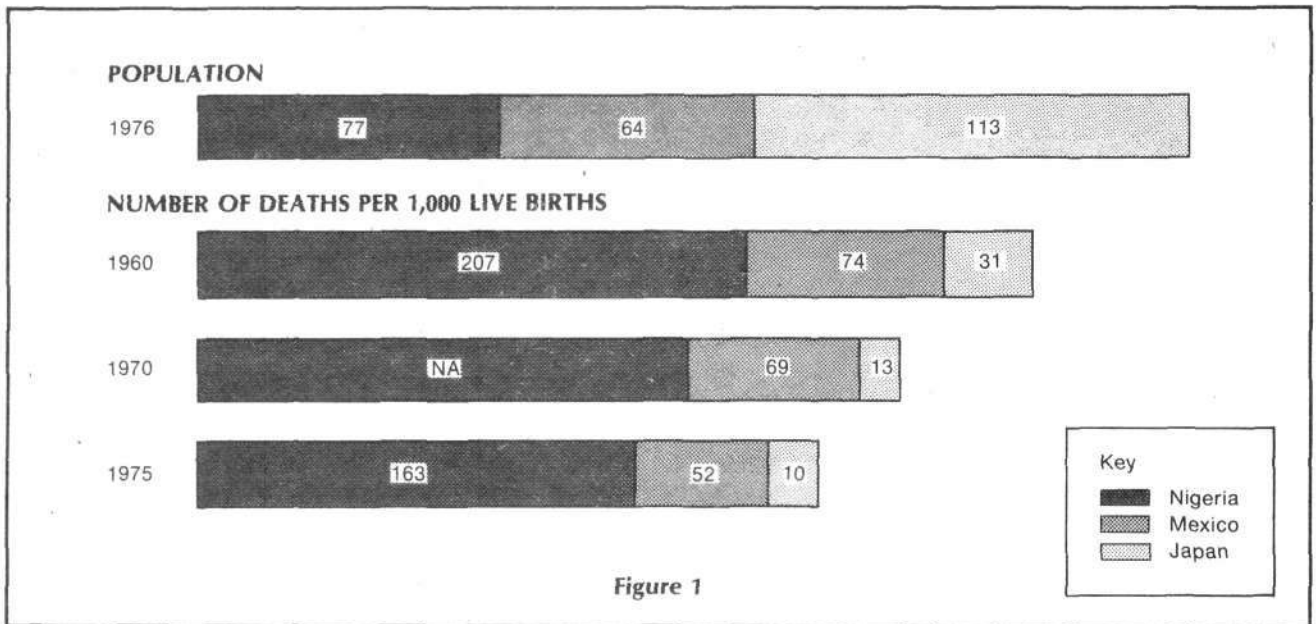
The Fusion Energy Foundation staff prepared this program as part of a report on Nigerian development for the Paris FEF conference and for a university conference on African development held in the United States.



IF IT ADOPTS A POLICY of nuclear-based, high-technology agricultural and industrial production, within two generations Nigeria can become the center of a vast West African development region. The next generation produced by this achievement will be as advanced as the population anywhere else in the entire world and will change the face of the continent.

Although breathtaking in its vision, this conception is

Although breathtaking in its vision, this conception is



entirely consistent with Africa's actual heritage of humanist civilization. Thousands of years before the flowering of Mediterranean-centered civilization, advanced urban and commercial cultures flourished from the Sudan and Ethiopia down into southern Africa. These cultures, in turn, reflected an even older integrated Atlantic civilization encompassing city-building and technologically advanced cultures in South America, Africa, and western and northern Europe as long ago as 10 millennia.

The policy created by the International Monetary Fund and the World Bank of so-called appropriate or soft technologies not only is contrary to this tradition of advanced African civilization, but also ensures that the continent will never regain the prosperity of its ancient civilization nor gain the national sovereignty and progress to which the African nations aspire.

It is entirely appropriate, therefore, that the core of Nigeria's development effort be a West African Academy modeled on Plato's Academy of Athens and representing the highest theoretical and practical attainments of humanity. The immediate purpose of the Academy would be to produce a leading intellectual stratum that fully comprehends the history, theory, and practice of global economic development; that is literate in the frontier areas of scientific research that represent the potentiality for quantum jumps in the productivity of technology; and that masters the epistemology and pedagogy through which these concepts and knowledge can be transmitted down through every level of the educational and economic system to the entirety of the population.

To fulfill these aims, the Academy must function simultaneously as a planning center for nuclear-based regional and national economic development, the top pedagogical level of the educational system, and a center for advanced scientific research. Therefore, the Academy would subsume a number of scientific and technical institutes that import the most advanced research devices and practi-

tioners globally.

Prominent in this effort would be a fission and fusion institute containing, for example, a research tokamak from the Soviet Union as well as Indian and U.S. nuclear and plasma specialists. This would orient the entire development effort to the most advanced horizon, represented by fusion torch extraction and processing of raw materials and the fusion-based nuplex.

Likewise, agriculture and medicine would be paced by the most advanced and productive high-technology diagnostics and frontier research areas, such as recombinant DNA.

Coordinated by the Academy and administered by its graduates, dozens of universities and thousands of high schools and junior high schools would develop curricula and training programs based on this universal development conception and its subsumed scientific, technological, and cultural features. Within this framework, the existing Nigerian educational system and other nations' experiments in coordinating education at workplaces, construction sites, and schools and among primary, secondary, university, and professional levels can be reassessed for their relevance to the universal development perspective.

City-Building Versus the IMF

Such an ambitious program for Nigerian development and the organization of the Nigerian educational system may at first seem unthinkable, but it must be stressed that the present condition in which most of the developing sector now finds itself trapped is not a natural condition. The combination of limited or stagnant development, growing indebtedness, and immiseration is a direct result of the post-World-War-II system set up by the World Bank and the International Monetary Fund.

It is no accident that the fruits of such a system are so contrary to the program for Nigerian development outlined here. These different systems reflect two totally

ACHIEVING SELF-SUSTAINING DEVELOPMENT

Transforming Nigeria into the center of development for West Africa will require a vast mobilization of capital and population resources to break through simultaneously on the fronts of industrialization, energy production, agricultural modernization, and upgrading the quantity and quality of labor power. No "bandaid" approach will enable Nigeria to reach the stage of self-sustaining development necessary to transform the nation and the continent.

As the selected comparisons here of Nigeria, Mexico, and Japan demonstrate, Nigeria will have to shift from a primarily agricultural society to an industrial one. This means, as the figures show, vastly increasing the numbers of people capable of teaching others and capable of skilled technical and scientific work, increasing the per capita energy production and use, and increasing the industrial output—all at the same time.

opposed tendencies in history. The one responsible for the continuing backwardness and instability of the postwar period is the oligarchical principle, which views science and progress as enemies. The oligarchic outlook is responsible for the enforced colonial backwardness of the British Empire, its continuation as neocolonialism in the crippling form of labor-intensive agriculture and the resulting spiral of indebtedness to the IMF and World Bank, and, most damaging, the belief that man is indistinguishable from beasts.

The opposing tendency in history, the city-building faction or Neoplatonic humanism, is exemplified by the American Revolution and the republican, nation-building developments throughout the world in the last two centuries. The humanist faction has acted on the knowledge that humanity is absolutely distinguishable from beasts by virtue of man's unlimited creative capacity to willfully increase his mastery of the ordering of the physical universe. This is the common theme throughout history of the greatest leaders of religion, science, and nation building.

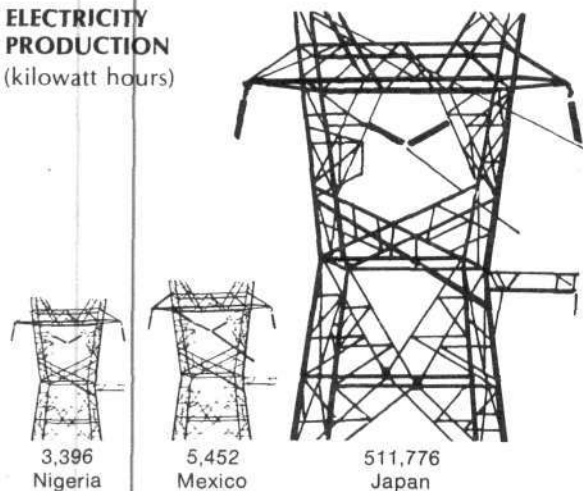
The process of economic development that has characterized the city-builders throughout history defines both the motivating force and the core contents of education today. In fact, there can be no effective education without development.

Nigeria's special combination of human and material resources determines the conception of development that must guide its educational and economic policy. The large Islamic and Christian components of the population and the vast potentiality for agricultural and industrial development based on Nigeria's oil resources and river and coastal water systems make Nigeria a natural bridge between Islamic and non-Islamic Africa, between the former British and non-British African areas, and between Africa and the Islamic world centered in the Mideast.

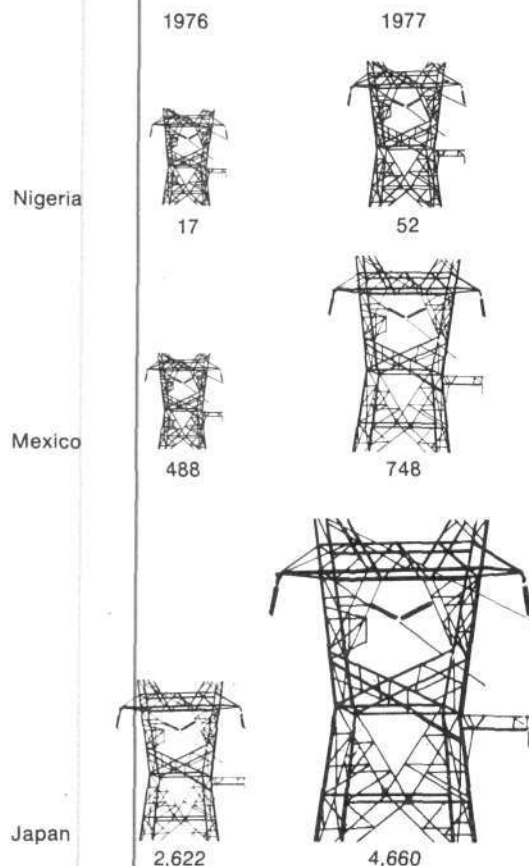
More broadly, Nigeria must play the type of leading

Figure 2

ELECTRICITY PRODUCTION (kilowatt hours)



PER CAPITA CONSUMPTION OF ELECTRICITY (kilowatt hours)



role for Africa in global development that Mexico and India represent, respectively, for Latin America and Asia.

The basic question is: What is required for Nigeria to play such a strategic role in global development as well as to successfully achieve self-sustaining economic development?

The answer is that development policy must be conceived and administered from the top down, based on large-scale, integrated city-building and agroindustrial complexes. At the pinnacle of the effort, the West African Academy will provide the institutional model of education and research and the top stratum of leadership that can then be reproduced and radiated out into all other sub-sectors of the economy.

With the proper development of its labor power, Nigeria is ideally suited to serve as a magnet for the development of all of West Africa. A natural matrix is formed by the sweep of the Rivers Niger and Benue and their tributaries west into Mali, Guinea, and Senegal and northeast into Cameroon, Niger, and Chad. Along with access directly from the Gulf of Guinea, the water system provides the transportation grid and the spine for a series of interconnected development complexes. This hydrological net-

work is also key to stabilizing and beginning to reclaim the Sahel in the future.

Along the river network, and especially at the region of intersection of the Niger and Benue where the new Abaju federal capital district is planned, new cities surrounded by regions of modern agriculture can provide the model for the entire continent. The construction of the Warri and Ajaokuta steel plants, and the Bonny Liquefied Natural Gas project are just a small glimpse of Nigeria's full potentialities.

In terms of the primary resource of Nigeria, its population and its productive powers, the objective is to reduce the percentage of the population engaged in agriculture by using advanced agricultural technology to increase the productivity of the agricultural sector. Simultaneously, this will free the labor power required for expansion of the industrial sector so that a sufficiently increased economic output and surplus are generated to support the modernization of agriculture as well as a rapidly expanding infrastructure, especially in education. The educational system itself must be growing rapidly enough to absorb a large fraction of its own graduates as well as train the skilled industrial and agricultural workforce.

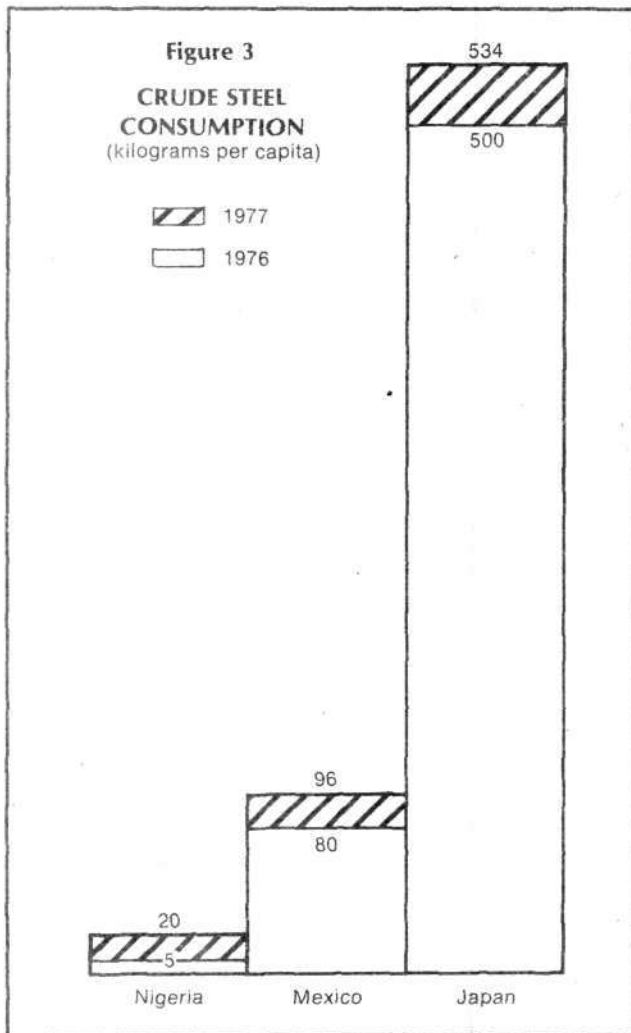
In short, Nigerian development will parallel the efforts planned or underway in the other major strategic developing sectors: the development of vast agriculture-petrochemical-port-and-rail complexes in Mexico, backed up by replacement of fossil-fueled energy with nuclear power; the harnessing of the immense hydraulic energy and agriculture system of the Ganges-Brahmaputra River system in India, also in coordination with full scientific and nuclear development; and the reclaiming of the fertile crescent of the Mideast along with extensive nuclear, steel, petrochemical, and desalination projects in the Persian Gulf and the Levant.

The realization of this vision will be made possible by the financial and technology-transfer instruments that are central to the just-initiated European Monetary System (EMS). This EMS participation will make it possible to far exceed what can be accomplished by relying solely on internally generated revenues, such as those from the Nigerian oil industry.

The Nuplex Concept

The focal points of development will be economic aggregates known as *nuplexes*, one or more nuclear power plants surrounded by an agroindustrial complex. The point is to develop a region by first putting down a power, transport, and infrastructural grid and then to fill it up, module by module. Specifically, the cheapest and most productive format for regional development is to lay down a nuclear-based power grid for a modular urban development.

Pairs or clusters of nuclear plants provide not only electricity but also heat and steam for interfaced industrial production facilities whose outputs include vital agricultural materials such as fertilizer and agrochemicals. The urban core, built up with modular construction tech-



niques, provides the level of housing, health care, education, and training appropriate to the needs of a labor force that assimilates advanced production technologies while building the energy-generating units. Such a trained and educated labor force becomes the basis for the skilled workforce required by new industries as well as for the training of fresh recruits from the rural population. Secondary industrial and agricultural belts can be radiated outward from around these nodal river-cities.

Limited Development Won't Work

Nigeria's recent history indicates why only the type of program outlined here, based on a city-building perspective, can work. Up until 1978, Nigeria managed to finance its industrial growth primarily with foreign exchange earned by the export of its oil. However, last February's fall in the oil market sparked a vigorous search for foreign investors that resulted in two billion-dollar Eurodollar loans and several other credit extensions.

This year, the Nigerian federal government will have to decide whether it will heed the warnings of the World Bank, the *Financial Times*, the *New York Times*, and *West Africa* magazine, all of which have warned repeatedly that Nigeria is headed for credit problems unless it curtails its ambitious development plans and resumes "pay as you go" financing.

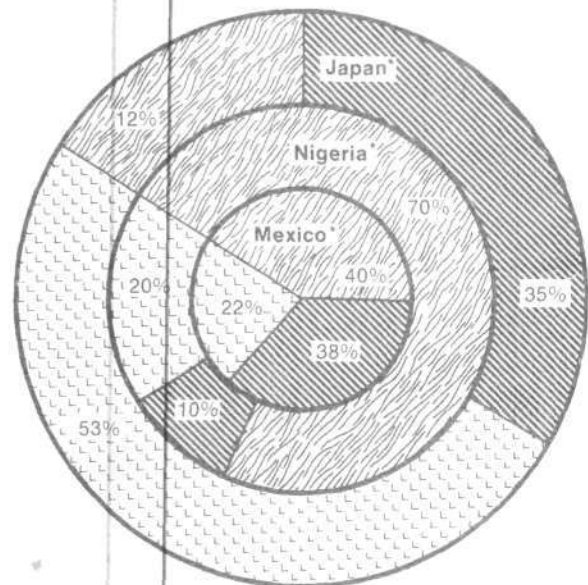
Contrary to the World Bank, we propose that the only fiscally responsible course of action for Nigeria is to increase its borrowing by an order of magnitude. Fortunately, a new international financial structure is approaching the point where this can be done under terms that will allow for the generation of net profit both for Nigeria and for its prospective creditors.

This is the only way out of the bind of reliance on oil revenues or on the IMF. Nigeria's production of 2.2 million barrels of crude a day makes it the number one oil producer in Africa, and its exports of 2 million barrels a day place it ahead of Libya or Algeria. However, Nigeria's population is 80 million—30 times that of Libya and 4 times that of Algeria. The oil surplus that may be more than sufficient to meet the immediate development potential of Libya is totally insufficient for Nigeria.

A comparison of Nigeria to the United States makes the question even clearer. The United States has three times the population of Nigeria and five times the oil production, but still imports 30 percent of its oil needs. If one adds to this the fact that oil is now the only major foreign exchange earner for Nigeria, the truth is clear. The reliance on generating a surplus from oil production implies a future of continuing impoverishment for the majority of Nigeria's 80 million people.

Any program of limited development must rather quickly exhaust resources, skilled manpower, or capital. The economy cannot be built up from the bottom by spreading available revenues among various sectors. Under these conditions, either the growth of industry will outstrip the rate of production of teachers and skilled labor or the rate of population growth will outpace increases in food, industrial production, or services. Any

Figure 4
COMPARISON OF WORKFORCE
BY AREA OF EMPLOYMENT (in millions)



Services Industry Agriculture

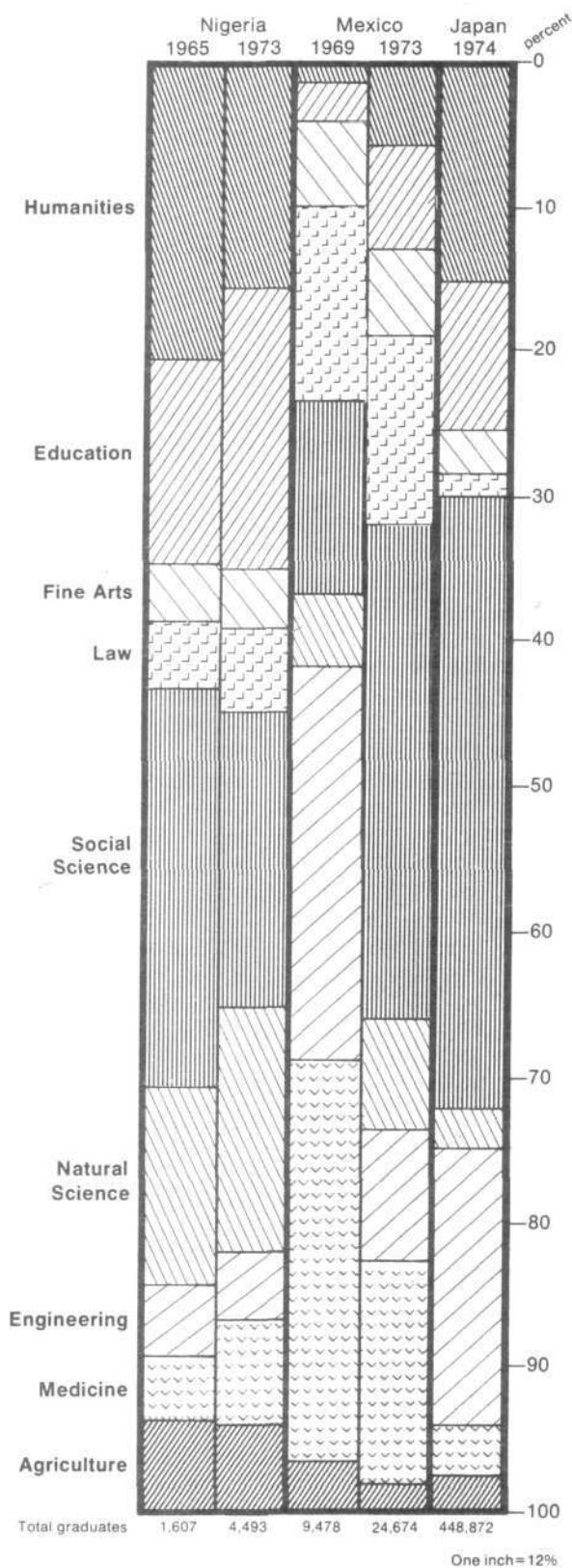
* Represents 100% workforce in each country:
Japan—53,420; Nigeria—22,278; Mexico—18,043.



United Nations

Construction to expand the Faculty of Engineering at the University of Lagos, Nigeria.

Figure 5
GRADUATES BY AREA OF STUDY



variant of these conditions, representing the failure to achieve self-sustaining development, must lead to chronic underdevelopment of the majority of the population or even to total economic collapse.

The Demographic Proof

Although there are absolutely rigorous theoretical methods and elaborate analytic methods to conclusively prove this thesis—including the economic model and computer simulation that the Fusion Energy Foundation has participated in developing along with corporate associates—a review of the basic demographic statistics of Nigeria is sufficient to make the case. The simplest means of demonstration is to compare the Nigerian population to that of Mexico and Japan. All three countries have populations of approximately the same order of magnitude (100 million), with Mexico representing a somewhat more developed case (the immediate next phase for Nigeria) and Japan a mature industrialized phase, which must also be passed through on the way to fully self-sustained development.

In the tables we show the vital statistics for per capita consumption of basic resources and the distribution of teachers and output of trained graduates for the three countries. Nigeria is approximately two orders of magnitude below Japan in per capita energy and steel consumption, and about one order of magnitude lower than Mexico. This correlates with Nigeria's relatively larger peasantry, as well as the relatively smaller percentage of teachers and the more modest output of graduates.

The percentage of the workforce required in agriculture ranges from 12 percent in Japan to 45 percent in Mexico and 70 percent in Nigeria. Although there has been significant growth in all categories of Nigerian students and teachers during the 1970s, the same gap of one or two orders of magnitude relative to Mexico (or Brazil) and Japan exists for the critical stratum of technicians, engineers, and scientists. This is the key bottleneck that must be broken—from the top down—to provide the teachers and technicians who will create a population capable of transforming and further developing the economy.

This can be achieved only by a massive, coordinated mobilization of capital and population resources to break through simultaneously on the fronts of industrialization, energy production, modernization of agriculture, and upgrading the quantity and quality of labor power. Only in these circumstances can all Nigerians trained abroad be productively absorbed in the Nigerian economy and infrastructure in order to rapidly reproduce their talents in others.

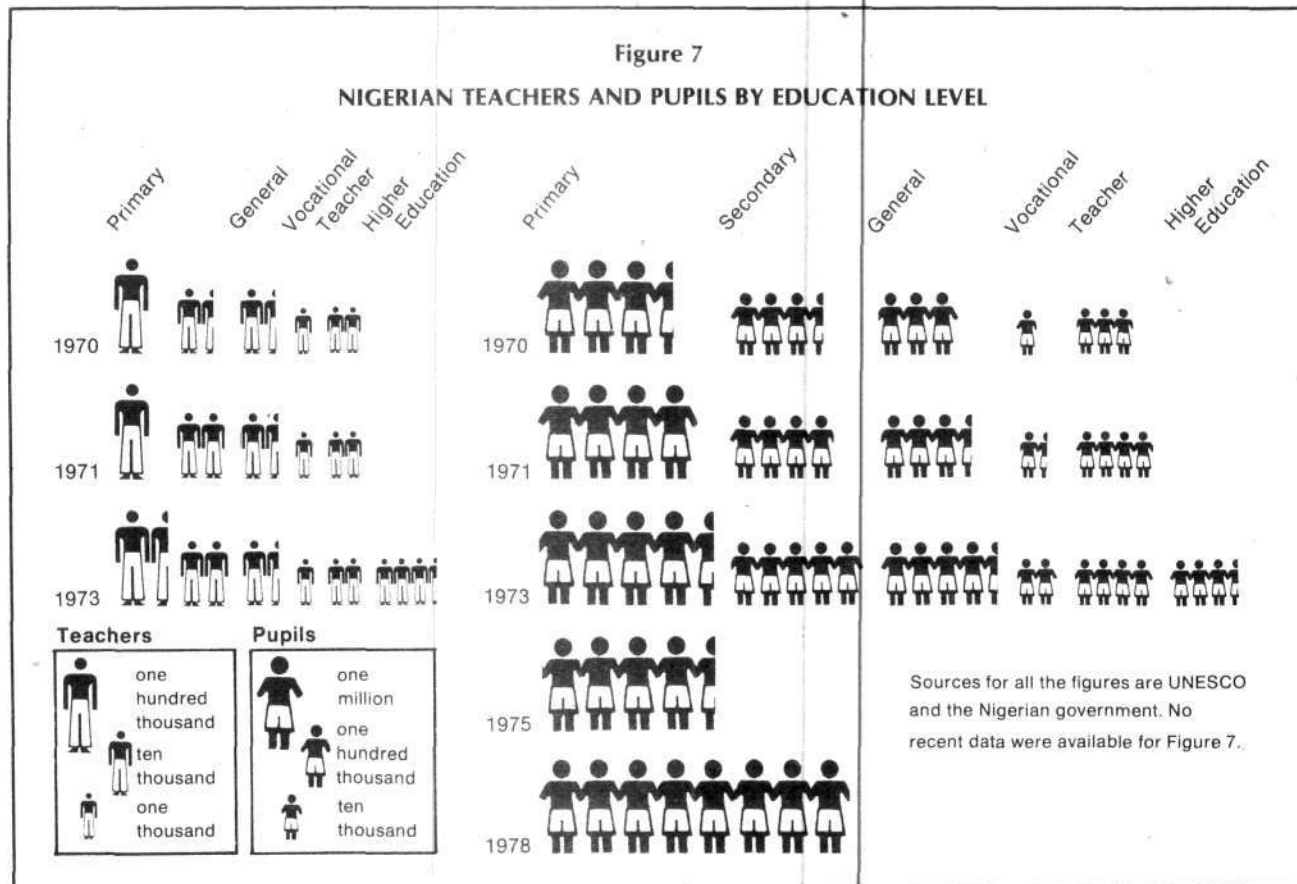
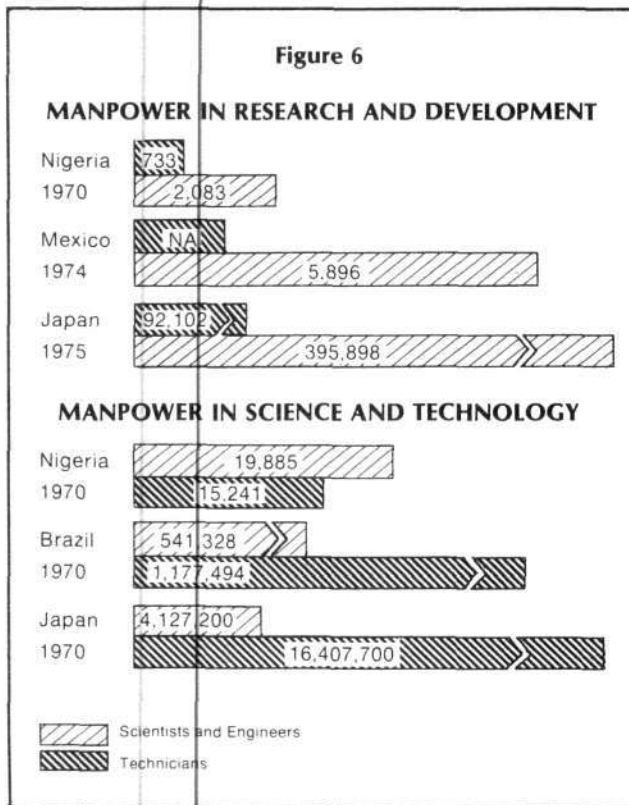
Where will the required capital inputs come from, and how can such a large foreign investment not undermine national sovereignty?

The fundamental concept of the EMS is precisely the issuing of long-term, low-interest credit for hard-commodity production. The monetary system and development fund associated with the EMS are premised on the mutual interest of the advanced and the developing sectors in the creation of vast new amounts of real wealth generated by

self-sustaining development in both sectors. As the EMS becomes associated with the capital markets of the Japanese, the Organization of Oil Producing Countries, and expanded trade agreements with the Comecon sector, an investment pool of many hundreds of billions of dollars will be available for financing massive technology transfer to the developing sector. The payback will be in the form of the surpluses generated above and beyond the requirements for further growth of developing-sector industrial and agricultural centers.

Just as for national development, however, all the requisite international arrangements must be put together near-simultaneously for the EMS-financed new world economic order to function. The fact that there is no other path to continuous development underscores the importance of commitment by the government of Nigeria to align with the EMS leaderships of France and West Germany, and the developing sector statesmanship exemplified by President Lopez Portillo of Mexico.

Among the constellation of industrialized, resource-rich, and leading developing-sector nations, the capital as well as the technical, economic, and pedagogical assistance are available to bring Nigeria into the 21st century as a highly developed and influential sovereign nation in world affairs. As the dimensions of the holocaust of disease and destruction on the African continent make clear, if the present opportunity is not seized, it is unlikely that it will ever come again.



A Theory of Development for African Labor

by Lyndon H. LaRouche, Jr.



EXCEPTING BRITISH-INFLUENCED GROUPINGS in Africa, every leading force on that continent either welcomes or at least converges on agreement with the developmental perspectives associated with France's Giscard d'Estaing and West Germany's Chancellor Helmut Schmidt. All among us who are working for economic development of the African continent broadly agree that our task is not merely transferring modern technology to the developing nations. Technology is indispensable, but it must be understood as the tools indispensable to realizing the development of predominantly long-oppressed peoples.

Technology transfer cannot succeed without an accompanying development of the minds and longevity of the African people generally. We may be confident, and justly so, that we might prove able to stumble pragmatically into good results without a theory of mental development. The word "might" carries with it the connotation of risk or failure; it also conveys the implication of shortfalls significantly below the level that would be attained by more thoughtful approaches.

As the use of British agent Asharite Ayatollah Khomeini for the destabilization of Iran warns us, the British agents and dupes in Africa, who are a significant problem in



United Nations/J.P. Laffont

"We are working to place the present and future order of this entire globe under the rule of the Grand Design." Above, Angolan children in Luanda anticipating victory a few months before independence day, Nov. 11, 1975.

total, will use the rhetoric of "cultural imperialism" and other refuse of British colonial office "cultural relativist" heritages against modernization efforts. Putting British influence in Africa to one side, how do we aid Africans in achieving the most rapid realization of the peoples' mental potentialities, for mastering the advanced technologies African industry and agriculture urgently require?

We dare not risk lacking a sound theory of cultural development. This must be a theory that properly correlates scientific and technological progress with what we may loosely term cultural progress.

To reach the desired result, we must overcome two categories of obstacles. First, we must discredit and discard widely held delusions concerning science and culture, delusions widespread among both European and African circles. Second, in place of those delusions, we must supply an applicable set of policies, a set of policies made comprehensible for practice with aid of the appropriate theory.

This article is a summary of the wanted approaches to these two, interconnected problems.

My procedure here is as follows:

Through British hegemony over Holy Alliance Europe following the 1815 Treaty of Vienna, the viable currents of European continental scientific thought were either pushed into corners, such as Germany's Göttingen and Russia's Petrograd, or pushed out of influence among leading universities and other channels of indoctrination of educated and other citizens. This was complemented by the effects of the City of London's direct and indirect domination of most of the life of the colonial and semi-colonial nations.

British colonialist domination imposed an artificial backwardness on many nations and their peoples. It caused both an abnormal stagnation of cultural development and even cultural retrogressions. The effects of these London-centered influences on industrialized and developing nations have been a "set of facts." These "facts" are widely employed as evidence that purportedly proves certain delusions. In this way, misinterpretation of the actual causes for such "facts" both provides a rationalization for preexisting and prevailing conditions and employs those rationalizations as a theoretical basis for current policy judgments. *Post hoc ergo propter hoc* has become the rationalization for perpetuating old miseries in new, sometimes more hideous forms. Hence, the appropriateness of the term neocolonialism.

Taking this and related problems of widely held delusions into account as I proceed toward statement of my theoretical points, I begin with a review of relevant historical matters. I outline a counterhistoriography to that of Arnold Toynbee and like-minded British apologists.

The Atlantis Issue

Since Francis Bacon's *New Atlantis*, the British oligarchical faction and its allies have premised their defense of the faction's policies not only on a willful distortion of ancient Egyptian and Roman history. There has also been a significant, included element of a distorted version of

an "Atlantis culture." The characteristic feature of the British hoax is the historiographers' refusal to take adequately into account such matters as the millennial conflict between the priesthoods of Amon and Thebes. With aid of wild falsification of fact, the British homogenize selected historical facts together with outright hoaxes. The effect and intended result of this fraud is to portray the course of human history as intrinsically one of yin-yang-like cycles: periods of rebirths of civilization separated by "dark ages." A distorted account of an ancient "Atlantis culture" is frequently included in such indoctrination and is almost invariably implied by given accounts.

Admittedly, the accounted rise of human civilization has known a number of dark ages.

The most recent were the 13th-14th century Dark Age, from the defeat of the Hohenstaufen through the Black Death, plus what can be termed the semi-dark-age of grave crisis from the closing decade of the 16th century into the 1648-1653 period. Leading British circles, most emphatically those associated with the evil Bertrand Russell, have adopted the perspective of a new, most monstrous "New Dark Age," to be inaugurated during this present century.

The most famous of the dark ages, and perhaps the most calamitous, occurred over approximately a four-century period, from the explosion of the Aegean island of Thera during the 13th century BC to the founding of Carthage and the rise of Etruscan and Ionian culture during the 850-800 BC period. It is clear that the rise of the Egyptian Fifth Dynasty (circa 2750 BC) reflects the occurrence of another major Dark Age.

Various civilizations have indeed been plunged back toward savagery through dark-age periods of savage depopulation.

The British view is that the occurrence of such a pattern of dark ages proves the Toynbeean sort of nonsense. The argument is that such catastrophes are inherent in the human condition, or in nature, or in both.

Although geological-meteorological traumas have performed a key part in the emergence of dark ages, there is nothing inherent in the human condition, or nature generally, that requires a continuation of such a pattern. The common root of the dark ages is the emerging predominance of a political faction that absorbs scientific and technological progress. This faction is best known over the ages of literary history of mankind as the oligarchical faction, the same faction the British oligarchy and its allies represent today.

Pending development and use of new bathyscaphe technologies for exploring sunken former littoral sites of chalcolithic cultures, the following summarizes broadly what is known with certainty concerning the actual existence of an Atlantis culture. Citing this knowledge purges the intellectual atmosphere of superstitious mythologies and aids us in appreciating the importance Plato attached to the Atlantis matter in writing the *Timaeus* and *Critias* dialogues. That approach to historiography aids us considerably in arriving at an adequate notion of the theory of culture.



Source: M.P.K. Sorrenson, *Origins of European Settlement in Kenya*, (Nairobi: Oxford University Press, 1968).

"We have in East Africa the rare experience of dealing with a *tabula rasa*, an almost untouched and sparsely inhabited country, where we can do as we will..." These were the words of Sir Charles Eliot, appointed Commissioner of the East Africa Protectorate (now Kenya) in 1900. Here, his predecessor, Sir Arthur Hardinge, negotiates with a Masai leader in 1898.

Working backward, with aid of geological data, from the time of the *Iliad* and *Odyssey* and from the explosion of Thera, we discover the long preceding period geologically as one of secular raising of the level of the world's oceans. In Mediterranean-European history, this pattern is associated with important periodic seismic activity along the ridge running through the Mediterranean and up into the Iceland region. The trauma associated with geological catastrophes intersected the conflicts between chalcolithic maritime-littoral-riparian advanced cultures and relatively bestialized, neolithic-oriented hinterlands cultures. It includes conquests of trauma-weakened, chalcolithic city-builder cultures by the forces of backward cultures.

The evidence is essentially this. We must date the emergence of the chalcolithic to no later than some yet-to-be-determined point between the 20th and 10th millennia BC. The evidentiary problem of archeologists is that out of this chalcolithic culture emerged a global maritime-littoral-riparian culture whose key sites were, predominantly, successively inundated by the rising of the ocean levels into the second millennium BC. Exemplary is the case of the sunken sites of a megalithic maritime-littoral culture of the Peoples of the Sea around the now-half-sunken island of Helgoland.

There is no sunken "lost continent of Atlantis." None of the relevant ancient accounts asserts that there was. The continent is the Western Hemisphere. What is asserted in Plato's account, in particular, is that there is a sunken island in the vicinity of the Azores, an island which Solon's Egyptian informant identified as a principal element of a

vast, transatlantic maritime power. It is quite credible, archeologically and geologically, to posit the possible existence of such a sunken island in the order of 500 feet beneath the present surface of the Atlantic and to date this as inhabited territory in the vicinity of the 10th millennium BC.

Just as Schliemann demonstrated the *Iliad* to be a remarkably accurate historical document through his excavations, so the *Odyssey* bears up.¹ Using a long ship, not much unlike the Viking long ships and probably copper-sheathed, Ulysses and his companions sailed out through the Straits of Gibraltar, reaching the Caribbean to encounter sites whose existence was known putatively to them by reputation. This coincides with the fact that the Mayan civilization, which achieved so high a degree of competence in astronomy, could not have been on the mere slash-and-burn level of agriculture.

These and other facts make a discredited wreckage of both sociology and anthropology as currently taught. What are accounted as "primitive cultures" are, at least very often, the degenerated shards of older, higher cultures. It discredits the so-called hydraulic model of early riparian civilizations, obliging us to search for the maritime-littoral cultures of which riparian developments were extensions.

Although the evidence discredits the "cultural evolution" faction of anthropology as well as the nakedly fraudulent "cultural relativist" doctrines, it does not eliminate the fact of evolutionary principles in cultural development.

What survives is a *law of cultural development*. This law specifies that cultures that fail to accomplish a certain, lawfully ordered kind of development must pay the penalties of hideous depopulation and degradation of survivor populations in the direction of savagery.

What is discredited is the autochthonous, mechanistic, fatalistic doctrine of isolated evolutionary development of cultures, in favor of a *voluntarist-dirigist principle of man's obligation to willfully discover and master the lawful prerequisites of continued development*.

Civilizing the Hinterlands

From this standpoint, we ought to be aided to see more clearly Plato's point of concern for Atlantis in the *Timaeus* and *Critias*. True, geological-meteorological catastrophes did trigger dark ages. The destruction of maritime-littoral centers of power of advanced culture left the survivors vulnerable to conquest and domination by backward, hinterlands cultures.

Was the Biblical Tower of Babel a structure on an island-empire base situated in the vicinity of the Azores during the 10th millennium BC? That idea may be classed as speculation in and of itself. The philological and other connections among various peoples, including the Berbers, the pre-Celtian Iberians, the pre-Celtic populations of Brittany, the British Isles, plus the Helgoland-Baltic region and Central America, are powerful circumstantial evidence that a great maritime-littoral chalcolithic culture, as ancient or more ancient than the 10th millennium BC, did indeed represent a multilanguage culture. The outline of the past is clear; the details are still shrouded in dark waters and ancient mists.

The lesson to be adduced from the outline is that civilization cannot be secure unless the task of bringing modern technology and republican outlooks to the people of the "hinterlands" is accomplished. That is the central practical feature of Plato's writings, and also of the *Commedia* of Dante Alighieri.

Today, were the British to succeed in keeping the nations of the developing sector in the oppressive conditions of technological backwardness, whole regions of the world would be engulfed in the genocidal effects of perpetual Thirty Years Wars, with accompanying famine and epidemics. A billion or more of the world's population in the developing-sector would be wiped out rather quickly and the survivors degraded to an unimaginable degree of savagery. Under these circumstances, it is probable that biological and political holocaust would sweep over the industrialized sector, thus bringing upon the earth the most monstrous of all the dark ages to date.

That, I propose, is the lesson to be adduced from Plato's concern, a lesson most imperative for today's circumstances.

The 13th-14th Century Crisis

One of the clearest, best illustrations of the dark-age problem is given by the great depopulation that occurred from the point of the defeat of the Hohenstaufen and their allies into the resulting Black Death of the mid-14th century. Although reports usually isolate the Black Death

itself as the sole cause of the depopulation of this period and estimate that merely one-third of the population of central Europe was wiped out, the depopulation covers the entire near-century period and adds up to more than half of the population of Western Europe. It was the destruction of the economy under Black Guelph faction policies that so ravaged the economy of Europe, drove so many into vagabondage, and so forth—that so created the preconditions of famine and epidemic in which the Black Death was merely the final phase.²

The causes for this are not obscure. The defeat of the Hohenstaufen by the Black Guelphs, the overthrow of Alfonso the Wise, and the crushing of the Templars in favor of the Hospitallers marked a shift of policy from one of city-building and technological progress to a policy of zero-growth and fiscal-austerity.

The precedent for this hideous policy was the Roman Empire itself. St. Augustine rightly defines the Roman Empire's culture as a process of decay. *The Roman Empire did not decay; it was decay*. St. Augustine adequately defines Rome as a form of hideous moral decay. The moral imbecility of Rome's culture had an economic-policy correlative. The Roman historical republic, ruled by the Delphic cult of Apollo, was already a form of moral decay. The Roman Empire, whose pantheon of cults was dominated by the Ptolemaic cult of Isis, compares only with the hideousness of Old China culture as among the most monstrous forms of moral degeneracy that man has suffered in the historical record.

The period of semi-Dark-Age ravaging Europe into the 1648-1653 period had the same causes as the earlier 13th-14th century Dark Age.

Through the Augustinian-centered forces, the heirs of Dante Alighieri most significantly, the period following the Black Death into the middle of the 15th century was one of great revival, the Golden Renaissance. The influence of the Golden Renaissance reached a relative high point in the collaboration between Plethon and Cosimo de Medici centered in Padua-Florence and spread its influence for great good into the France of Louis XI and Tudor England. However, by the middle of the 15th century, evil was stoutly back in business. Evil, centered around the ancient "black nobility" families of Rome and their "black" Genoa allies, captured control of the monarchy of Aragon-Castile under Ferdinand and Isabella, and coordinated the fall of Paleologue Constantinople.

The rot of the oligarchical black nobility spread from Spain and Rome. The defeat of the forces of Cesare Borgia plunged Italy into a downfall from which it has not yet fully recovered. The vacillations of Queen Elizabeth in England aided the Genoa-controlled "black" factions around the Scottish lowland Stuarts and the Cecil family to grab control of England over the period into the Stuart accession of 1603. Oldenbarneveltdt was defeated in the Netherlands. Henri IV of Navarre was isolated and ultimately assassinated. The Thirty Years War was the culmination of this process.

Through the parallel efforts of the city-builder *politiques* in England and France, and through the work of Richelieu

and his heirs Mazarin and Colbert, through the rise of the Commonwealth Party to power in England, humanity was rescued from a worse disaster. Fortunately, despite the Scottish-based overthrow of the Commonwealth in 1660, the Commonwealth Party had taken a leaf from the policies of the Tudor Dudleys and the pages of Plato. Commonwealth Party colonies were established in North America, built around the most-literate among the parishes of England. During the 18th century, the mean cultural level of the population of the United States was double that of England: in literacy, in standard of living, and in social productivity. The transatlantic conspiracy of Commonwealth Party and Colbertist and Leibniz factions made the American Revolution and came near to succeeding in extending the influence of the American Revolution into Europe.

The issues that prompted the Marquis de Lafayette to break with Napoleon Bonaparte are inclusively key to successful British subjugation of the continent of Europe during most of the 19th century. The Marquis de Lafayette came close to succeeding in 1830. The British creation of Palmerston's various "radical" movements, such as the "Young Italy" movement of Giuseppe Mazzini, poisoned and wrecked the republican movement of Europe in the course of development and aftermath of the 1848 revolutions.³

The victory of President Abraham Lincoln over the British in the U.S. Civil War plus the Lincoln alliance with Czar Alexander II created the circumstances for a great industrial development principally in three nations: the United States, Japan, and Germany. It was this industrial development that brought the British to the edge of total, global defeat during the 1890s—at the hands of the alliance of France's Hanotaux, Germany, and Russia's Count Witte with Meiji Restoration factions in Japan.

Although the city-builder republican movements of the late 19th and 20th centuries have been generally philosophically puerile by comparison with their predecessors of the Golden Renaissance and the 16th and 17th centuries, the persistence of a dedication to scientific and technological progress, even in a purblind, pragmatic form, has so far prevented civilization from plunging into another dark age—despite two world wars of this century.

The Present Danger

At this moment of writing, the world verges to the brink of thermonuclear holocaust under the combined impetus of London, Peking, and their allies in various nations' leading circles. We dare not content ourselves at this juncture with a merely pragmatic, purblind approach to the furtherance of scientific and technological progress. We dare not do less than to quickly resurrect the most advanced philosophical knowledge and methods, to apply that knowledge, those methods appropriately to the great world-building tasks before us.

Those tasks center around finally and forever bringing all humanity out of the hinterlands of oppressive barbarism. We must proceed from a conscious mastery of the universal law of progress, and with assurance that the hegemonic combination of leading powers of the world

is unshakably dedicated to no other policy but that of fulfilling the requirements of a republican world order of generalized scientific and technological progress.

There must be no more Dark Ages for humanity. No factions dedicated to the oligarchical cause must be permitted to retain power in any nation. No people of any nation must be pushed into zero-growth practices and ideologies. Never again must there exist a combination of hinterlands population to threaten the human species with a new Dark Age.

A Concept of Culture

I now refer the reader to *The Theory of the European Monetary Fund*, where I demonstrate two essential points.⁴ First, I demonstrate in outline the economic theory for a general law of development. Second, I demonstrate that the conception of *negentropy*, which arises in that connection, is the proper conceptual foundation of all scientific knowledge. In other locations, my immediate collaborators and I have demonstrated the coherence of what is broadly termed "culture"—poetry-music, drama, painting, sculpture.⁵ Here I will employ the relevant conclusions demonstrated in those locations to attack the problem of the development of African culture.

It is appropriate to emphasize that my own fundamental contributions to economic theory are most conveniently characterized as applying the implications of Riemannian physics to the problem of deterministic economic models for the condition of constant technological advancement. This involved a more profound epistemological grasp of Riemannian physics than has been generally encountered among physicists heretofore.

Usually, Riemannian physics is understood to signify the more specific accomplishments of Riemann, rather than the "axiomatic" conceptions and methods by which his accomplishments were effected. My own point of departure was Riemann's notion of *fundamental hypothesis*. Riemann's fundamental hypothesis and the *higher hypothesis* of Plato are equivalent notions. Riemann's accomplishments may be successfully employed without accepting or comprehending the notion of fundamental hypothesis: the derivation of Riemann's physics cannot.

It was the notion of fundamental hypothesis, aided by coherent understanding of Cantor's derivation of the notion of the transfinite, that aided men in solving the most important of the remaining problems of economic theory.

The most obvious equivalent to the Platonic conception of higher hypothesis and Riemann's notion of fundamental hypothesis occurs within the framework of the well-tempered system of contrapuntal composition in music. This immediate connection between Riemannian physics and poetry-music is perhaps the most convenient bridge for bringing into light the equivalence between certain artistic and scientific thinking. With aid of the comprehension of the three levels of knowledge of Plato, Neoplatonic Christianity, the Koran, and Dante Alighieri's *Commedia*, we are aided to elaborate the needed theory of culture as a lawful conception for practical use.

However, before plunging into the elaboration of that point, we must clear away a certain amount of commonplace misassumptions concerning culture.

The African weighing the problems of introducing European technology into his continent often accompanies his thoughts on this process with a cautious or even resentful attitude toward the notion of superimposing European culture generally upon African peoples. We are not thinking at this moment of those African voices that are merely echoing the cultural-relativist doctrines of British mintage. We are expressing sympathy for the African who refuses to swallow credulously the *post hoc ergo propter hoc* argument that European technological superiority requires Africa to import, kit and caboodle, each jot and tittle of existing habits of thought and daily practice of the industrialized nations.

Africa's Cultural Challenge

African culture must be transformed, without a doubt. A culture that reflects the effects of imposed technological stagnation, in which the African mind's potentialities are deemphasized for emphasis upon the sensual appetites and impulses of the body, must be transformed. This transformation must occur along the principled lines best

exemplified by Dante's *Commedia*. The instant we pose the problem in those terms of reference, we have adopted a standard which impels us to cast aside many of the prevailing standards of artistic and other taste in European cultures themselves.

One cannot leap directly into the last, empyreal canto of Dante's *Commedia*. The Dante of the inside of the *Commedia*—as distinct from the Dante writing the *Commedia*—lifted himself out of the Inferno of irrationalist sensuality. That Dante walked with Virgil through the Purgatory and through fire into Paradise. The great future art of Africa will embody and celebrate Africa's own transformation of its cultures from the colonialist heritage of brutalization of peoples into irrationalist sensuality.

No doubt existing African stories and legends, including those that embody an outlook of irrationalist sensuality and superstition, will be transformed ironically by African artists. Such Neoplatonic methods of guiding artistic audiences through the upward steps of progress outlined by Dante's *Commedia* will become the corpus of an emerging African art. It is not adequate to preach finished virtues to a people; artists are required. The artist must get inside the mind of the audience, in the manner that Dante



United Nations/Gamma

"Only man can develop his mind." Here, children in a Sahelian refugee camp learn to read French.

illustrates the method, and guide the steps of African minds upward in that way from that point of intersection.

I do not propose that the greatest European art—that which is truly great rather than that which merely enjoys a favorable reputation at the moment—will not be assimilated in Africa. I propose to emphasize that it is the *method* of the Platonic dialogue, as the principle of art standing above any specifics of national culture, which is the only essential thing Africa *must* adopt from Europe. That European art that fulfills the standards of the *Platonic dialogue as method* should be valued in Africa, and will undoubtedly be honored as Africa develops. The rubbish of European culture, which now constitutes the numerically greater content of that culture, Africa will have the advantage to avoid more easily than Europe to rid itself of the same such refuse.

Scientific Culture

Once culture is defined from the vantage-point I have indicated here, a spectrum of indispensable conclusions follows. First, the culture reflected in poetry-music, painting, sculpture, architecture, drama, and so forth is as much a matter of scientific principles as is a proper mastery of modern physics. Moreover, the underlying principles of great art are the same principles that ought to inform a valid physics—the principles associated with Plato's notion of the higher hypothesis. Not only is there an agreement of this epistemological quality between great science and great art, but *the fostering of the kind of great art that fulfills those principles is indispensable for fostering scientific creativity within a population.* This means not only the fostering of great African scientific discoverers, but fostering most efficiently in the mind of the African citizen generally an enhanced capability for assimilating more advanced technological conceptions for generalized social practice.

Conversely, to the extent that Europe exports its own or an "Africanized" version of the rock counterculture to Africa, Europe will thus be impairing the capability of Africa to assimilate *modern technology.* Or, to the extent that Africa fails to liberate itself from primitive cultural traditions, a similar deterrence to progress will occur.

To restate the same point in the terms of reference of a preceding section, Plato's emphasis on the principles for development of the mental powers corresponds to the lessons of the dark ages. It is the lack of emphasis on technological progress among backward forms of rural-based and pastoral cultures and the tendency for mental and moral savagery among the oppressed and backward strata of otherwise advanced civilizations that makes societies vulnerable to the dark ages. All the achievements and beauties of great urbanized cultures are in imminent jeopardy until we have developed and effectively apply the conceptions needed to transform the peoples of the "hinterlands."

We must eliminate that ignorance and backwardness that have enabled the oligarchists repeatedly to transform masses of afflicted populations into social battering-rams against the institutions of civilization's generalized scientific and technological progress. Thus, although the Pla-

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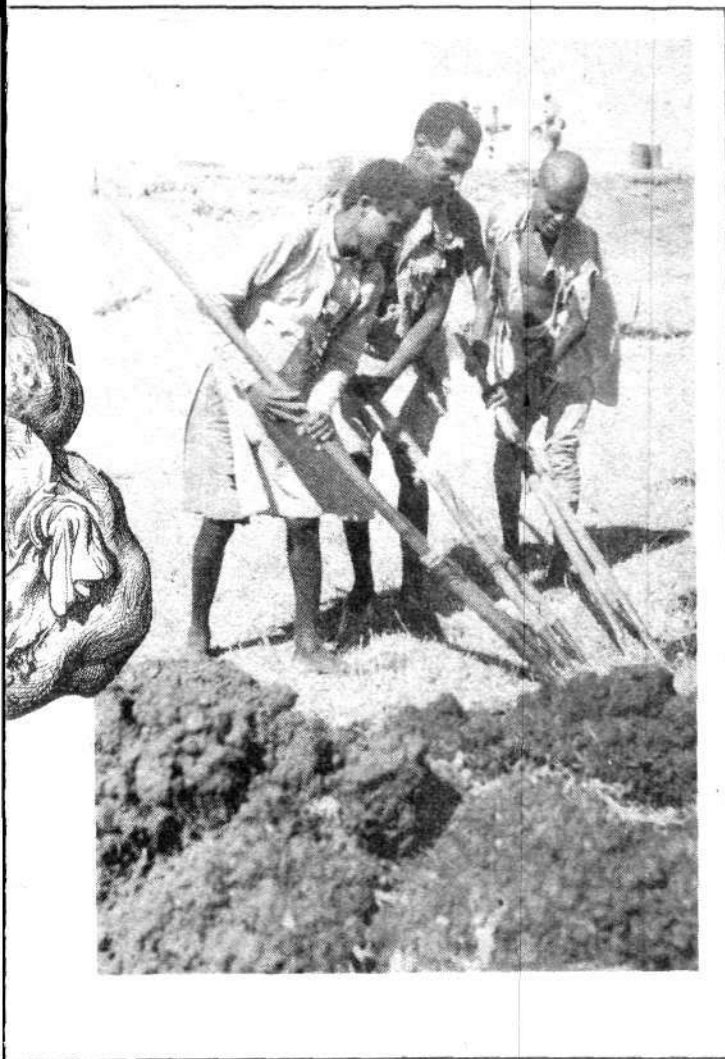
Illustration of Inferno by Gustav Doré, in *The Doré Illustrations for Dante's Divine Comedy*. (New York: Dover Publications, 1976); Photo: United Nations.

tonic method is the proper foundation for the development of scientific knowledge, it is equally, essentially, a concentration on the methods for elevating the mind of masses of people—including the oppressed peoples suffering the ignorance and backwardness of the "hinterlands."

The Example of Music

The great sources for the development of European polyphonic contrapuntal music are chiefly the Platonic Academy and the writings of the medieval Ismaili scientists al-Farabi and Ibn Sina. These sources insist that the well-tempered methods of music-poetry composition—in distinction to opposed methods—are a necessary experience for the fostering of the creative powers of the mind.

To make clear what I mean by opponents of this kind of music, I cite the British doctrine deployed against the great Johann Sebastian Bach and later deployed against Ludwig van Beethoven. The British insisted that music was nothing more than a pleasing melody with agreeable accompaniment and that music was chiefly a matter of exciting or otherwise pleasing sensual effects. That British



view has no compatibility with what is properly regarded as music or poetry.⁶

From the point of al-Farabi's proof for octave-species well-tempered scales and the definition of 24 major and minor scales for European well-tempered polyphony, music has been essentially defined as follows. This definition underlies the agreement between such music and scientific thinking.

If I sing within one of the 24 scales but then augment or diminish an appropriate note of that scale, I am singing in another of those scales. If I take the third, fourth, fifth, or sixth note of a scale and treat that as if it were the first note of a scale, I am singing in a different scale than the one from which I began, in which I sing notes that are variously augmented or diminished with respect to the pitches of the original-scale. By such and related means, I can move through all 24 of the major and minor scales in a lawful way.

If I choose a theme that is in one scale, and I repeat this theme in parallel vocal or instrumental voices accompanying the first, but starting at different beginning-points in time, and I follow the principles of the simple canon in

so doing, wonderful possibilities unfold for me as a prospective composer of music.

These are but the most elementary features of well-tempered contrapuntal musical composition. We have chosen to emphasize such elementary features to make the relevant point to the widest audience. We now continue, showing first why the well-tempered system is so important and what is potentially wonderful in a composition treated according to well-tempered principles.

It is probably well known to all that there is a school of argument that attempts to define a "natural" physical scale of pitches according to the principles of vibrating wires, strings, tubes, and so forth. According to that misguided school, these mathematical progressions of vibrating rods are presumed to be "natural pitches" of an octave-species scale. The deviations from such "natural pitches" are then explained as permissible changes in pitch-values for the purposes of convenience. One illustration of such a convenience is the problem of tuning keyboard instruments in such a way as to permit performing in any of the major and minor keys.

That school of argument is nonsensical.

If I am to sing within a domain of 24 major and minor keys, then each note I sing is simultaneously a tone, or an augmented or diminished tone, in every other among the 23 remaining keys. Therefore, we cannot sing—except monotonously—unless the value of the tone is determined simultaneously for all 24 keys, rather than merely as a note of an octave for one key. In other words, the 24 keys are not derived from a "natural" octave-species scale; the value of the tones of any one octave-species scale is determined by 24 keys taken as an indivisible, primary whole.

The importance of this is that the well-tempered system defines the 24 keys as a unified domain of tonal development. It is the lawful movement from one key to another within a single musical composition that is the indispensable definition of music. The requirement of such tonal development is the primary fact of the tonal side of music; it is the principle of development that determines what the pitches of the tones must be. There are no "natural pitches" in the sense one school assumes to be the case.

For reasons of convenience, I shall not review here the other formal aspect of musical development, metrical development. I merely make the observation that the metrical and tonal development of an actually well-tempered composition properly interrelate.

Musical Composition

Now let us, speaking hypothetically, proceed to compose some music. We shall employ the simplest rules of composition, those canonical principles for singing poetry in the time of Plato, or of Dante, Petrarch, or Leonardo da Vinci. For this purpose, no theory of harmony is needed—for reasons of proof I shall promptly identify.

In judging how to sing a line of poetry (which can be done invariably if it is genuinely poetry), we are governed by elementary musical rules.

We must observe the principles of the musical scale.

The vowel-consonant connections in spoken language are musical; pitch-values are implied. (It is not necessary to go into details here on that point.) Except in languages in which specific pitches are conventional, we are merely restricted. In modern European languages, for example, there is no exact pitch associated with a syllable, but rather a tendency to prefer certain relative values of pitch with respect to other syllables in the same vicinity of speech. Our first choice in singing a line of poetry would be to decide upon one of the 24 major or minor keys. We might make a more complicated choice, but it would be a choice of some lawful significance within the elaboration of a composition in the 24-key system. It would not be an arbitrary sequence of pitches. (You can do almost anything, provided you demonstrate it to have a lawful "resolution" within the course of the completed composition.)

There is a second level of refinement to be considered. If one were a frequenter of the Academy at Athens, or an associate of Dante, Petrarch, da Vinci, one would probably sing the poem to the accompaniment of a stringed instrument. This accompaniment would have no resemblance to a modern popular singer producing annoying monotony with a guitar. One would add the one or two voices performed on the instrument to the singing voice; the voice or voices of the instrument would sing a canon in concert with the singing voice. This polyphony would prompt a musician to consider further refinements of choice in selecting the sequence of notes for the original design of the sung line.

I noted above that no consideration of the theory of harmony is involved in this. It is not a matter of vertical chords. It would be better for music and for understanding the performance and composition of music to throw out the doctrine of vertical harmonies altogether.

Let us focus for a moment on the point at which the second voice of a canon comes in. Let us consider, now, the note in the first voice sung immediately preceding the first note of the second voice. That note in the first voice goes in two directions. It goes to the succeeding note in its own voice; it also goes to the first note in the second voice. That latter connection is a "cross-voice" relationship. It is not vertical harmonies that actually determine consonance and dissonance in polyphonic music; it is the complexity of cross-voice relationships.

The composition of a simple canon requires that the cross-voice relationships of the polyphony be lawfully meaningful throughout. You see, no doctrine of harmony is needed; indeed, the doctrine of harmony tends to distract the student from the real issue of the matter.

By constructing the thematic statement of a canon cleverly, one causes cross-voice relationships to emerge, which one brings forth as developed voices. It is in this way that well-tempered polyphonic counterpoint introduces exciting development within musical composition.

That is only the first doorway to musical composition, but it is adequate for defining our second point.

Development of the Theme

Once the composer has found an appropriate cross-voice-linked idea of musical development, the shading of

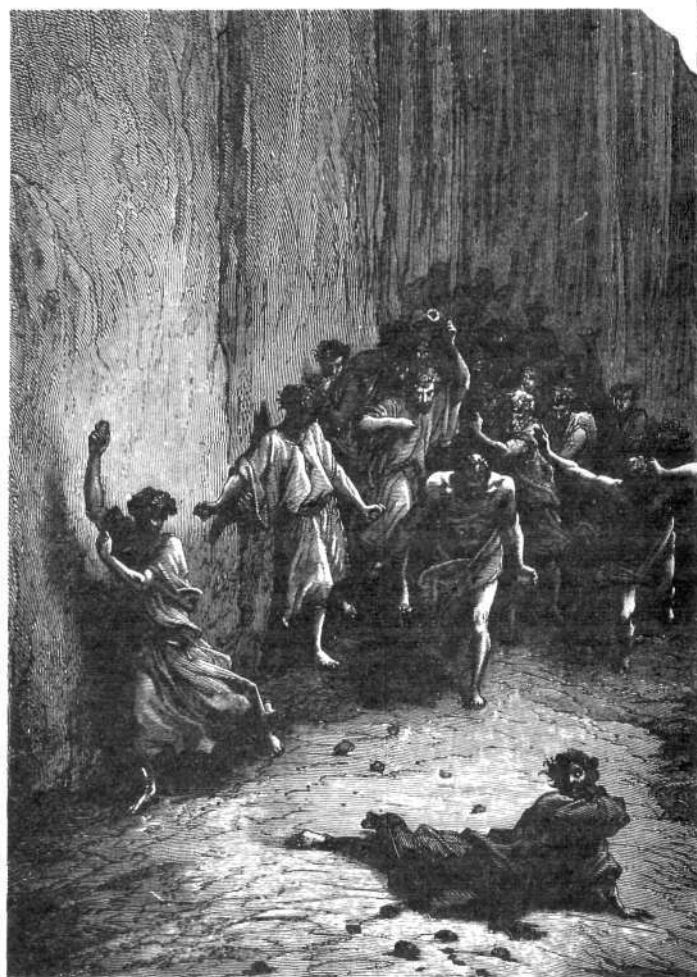


Illustration of Purgatory by Gustav Doré, in *The Doré Illustrations for Dante's Divine Comedy*. (New York: Dover Publications, 1976). Photo: United Nations.

the thematic statement for the canon is determined accordingly. In other words, musical development does not begin with themes as arbitrary givens. One searches, with aid of canonical method, for a kind of development that is suitable to one's purpose and then one defines the theme accordingly.

Thus, the canonical way in which thematic material is determined for a good musical composition is analogous to the way in which the well-tempered system determines the proper pitches of the tones. One proceeds from the concept of a whole development taken as an indivisible primary. One then determines the particular values—such as pitches, thematic material—which that development demands. It is the whole that is primary, and the particular that is relatively determined, relatively ephemeral.

Music has reached its highest degree of scientific development to date in the transformed notion of double-fugal counterpoint achieved in the later work of Ludwig van Beethoven. What is truly "double" in this is not the combining of two elements as in the ordinary notion of the double-fugal form. What is double is that in the development there is a development of a process of



We must eliminate that ignorance and backwardness that have enabled the oligarchists repeatedly to transform masses of afflicted populations into social battering-rams against the institutions of civilization's generalized scientific and technological progress.

development, a development of the second order. This brings Beethoven's greatest later works into agreement with Plato's notion of the higher hypothesis.

The point, as Plato, al-Farabi, Ibn Sina, and others emphasized, is that the well-tempered system of musical composition and performance locates music primarily in the creative processes of development embodied in the music. Music is not located in sensual effects, but in the process of lawful, creative development mediated through the domain of what might appear to some to be musical-sensual effects. It is not the sensual effects that define the intensity of "feeling" of a great musical composition; the intensity of feeling is the experience of lawful forms of creative development.

A Physics Analogy

The split in physics between Newtonian and Leibnizian-views divided European physical science into two bodies of thought and practice. The school associated with Leibniz was dubbed the hated school of Continental science by the British. From the time of Francis Bacon, and from the establishment of the British Royal Society under John

Locke's guidance, the British have devoted the subsequent centuries to the effort to discredit and suppress Continental science. On this point, the British have been explicit.

The exemplification of the essential differences between the two schools is the opposite way in which the two opposing methods regard the phenomenon of the wave. I shall thus illustrate how the school of Leibniz, sometimes termed the hydrodynamicist school, provides a view of the universe in epistemological agreement with the well-tempered system of musical composition. It is not so astonishing, therefore, that Bach was in the factional orbit of Leibniz, or that the British efforts to isolate, defame, and destroy Bach were coordinate with British efforts against the influence of Leibniz in science.

The Wave As Primary

In the Newtonian, or reductionist (elementary-particle-centered) view of physics, the wave is a mental construct invented by the mind as a convenient way of thinking about the resultant of a complex interaction among numerous particles in motion. In the Leibnizian school, any wave meriting that name (for purposes of physics) is a real, primary phenomenon that directly interreacts with other waves as wave-interaction. In the Leibniz view, the behavior of the particles participating in the wave is determined by the wave, not the other way around.

The most advanced understanding of this theoretical problem to date is provided through the pioneering discoveries of Riemann. Although Riemann is qualitatively more advanced than other hydrodynamicist schools of physics, Riemann's work is an advancement within the continental physics of Leibniz, Euler, the Bernouillis, et al. Even before 1860, Riemann developed remarkable proofs of the primacy of the wave as such—for which conclusive experimental proof was given by the fact that H-bombs work.⁷

The same Leibniz-Riemann approach is crucial to the main lines of progress for scientific research today.

In plasma physics, accelerators and related devices do not accelerate *individual* electrons, protons, and so forth. They accelerate plasmas. The effort to interpret scattering and other plasma reactions as particle-particle reactions is specious. The most anomalous sorts of reactions—those that defy an elementary particle sort of physics—have the characteristic feature that the collectivities of the plasmas behave as Riemannian waves.

Most dramatic among anomalies of this sort are those that involve the negentropic generation of plasma entities, such as solitons. These and related crucial evidence point in the direction of solving the problem of defining the distinctions and causal connections between the domains of inorganic and organic physics.

Energy Anomalies

The interesting sort of anomalous behavior is that in which the notion of energy as a scalar breaks down—together with the notion of electrons, protons, and so forth—as "elementary particles." These conventional notions of scalarized energy-measure and "elementary particles" define atoms, plasmas, and so forth in terms of an ostensible energy of the system. Hence, the provocative anomalies are those that confront us with manifestations

of organized reactions that depend upon causal influences in excess of what can be accounted for by the ostensible energy of the system. It appears that we have tapped something additional within the internal physics of the particles, a kind of physics that displays laws rather different from Maxwell-pivoted physics conceptions. We are obliged to think not of scalar magnitudes of energy, but of a higher form, "organized energy," an ostensible source of *negentropy* in certain higher organizations of atoms, plasmas, and so forth.

Biology is the most provocative vantage-point for viewing this.

Take two "organic" molecules. One is suited to be part of a living process; another of the same nominal composition is not. The difference between the two is *organization*, not atomic constituents.

This notion of organization, as key to the distinction of living tissue's constituents, is most provocative. Appropriate "soups" of such constituents reflect their characteristic organization in a manner heuristically analogous to the characteristic crystallization of inorganic substances. The term aperiodic crystal has been employed for biological processes on this account.

It has been noted that in the development of antennae, legs, and wings on flies metamorphosing from the larval form through pupation, it is the shape of the plate from which the limb grows that determines whether it will be a leg, or wing, and so forth. It is the "wave form" generated that governs the process's constituents.

Looking backward toward the root of this business, we come to the atom. We are looking for the font of *negentropy* in the living tissue. Whence does the tissue secure this *negentropy*? Certain molecular configurations tap the *negentropy* of the atom; others, of the same putative building blocks, do not. Anomalous plasma behavior shows that the atom and its ostensible constituents contain such potentialities. Currently we lack definite answers; but we know which track will ultimately be the fruitful one.

Nature is ordered in a manner directly opposite to the *assumptions of reductionist empiricism*. Fruitful scientific investigation also proceeds directly opposite to the guidance of reductionist-empiricist assumptions. Science proceeds by conceptualizing the characteristics of a whole process of coherent development; this conception enables the scientist to generate fruitful—if not always correct—hypotheses. Through a barrage of successive, fruitful hypotheses—in which we learn important knowledge even from mistaken hypotheses so projected—we determine a specific knowledge, much as the well-tempered notion of the tonal aspect of musical development determines the pitches of tones, and as canonical method applied to a conception of musical development guides the composer in determining the proper exact values of thematic material.

The Higher Hypothesis

The key to progress is typified by those methods of development of the individual that will yield the highest incidence of leading scientific discoverers. This method,



Illustration of Paradise by Gustave Doré, in *The Doré Illustrations for Dante's Divine Comedy*, (New York: Dover Publications, 1976); Photo: United Nations.

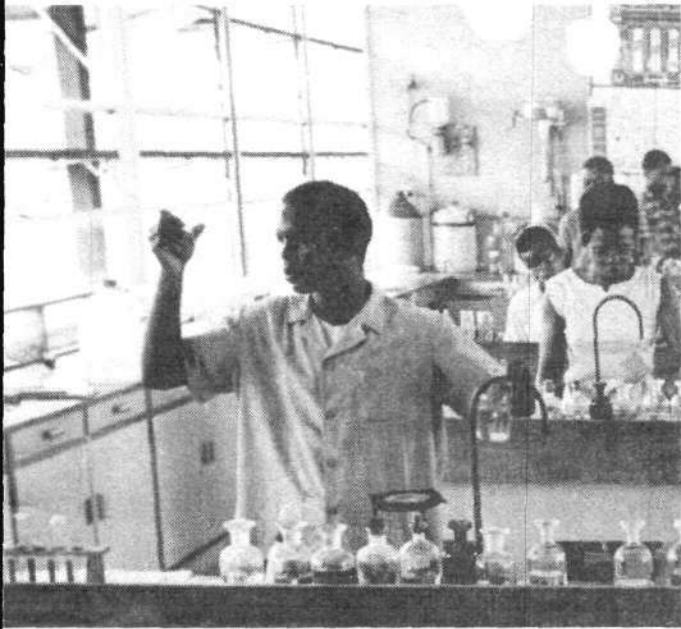
applied to the population as a whole, may not transform all of the population into leading scientists. It will be optimal in yielding the highest incidence of good engineers, technicians, and optimal results in fostering the technological aptitudes of the general population.

Therefore, if we now concentrate on the matter of optimal incidence of scientific discoverers, it should be understood that we are treating that incidence as a key parameter for all the correlated other benefits.

The epitome of the advanced scientific discoverer is the mind that has comprehended the higher hypothesis. Therefore, a directed effort to effect comprehension of Plato's notion of the higher hypothesis in the largest possible number of citizens is the method of approach that must tend to correlate with the best overall results among the population as a whole.

Even mere existing professional anthropologists, in some instances, have attempted to measure the degree of technological progress of various cultures in terms of the modal per capita throughput of energy in basic modes of production. As I demonstrate, that measure is an unavoid-

To produce the highest incidence of scientific discoverers, we must have a general culture that fosters progress of developing new citizens toward comprehension of the higher hypothesis.



able step of first approximation; however, as a parameter of the process of development it is fallacious, totally misleading.

As each level of technology defines a range of man-altered conditions as primary resources, those primary resources are also defined as relatively finite. This relative finiteness may be ostensibly a matter of absolute quantities of suitable primary-resources reserves available for exploitation; the relative finiteness may emphasize a limitation of steeply rising marginal cost of exploitation. This boundary-condition cannot be overcome without an increase in the per capita "reducing-power" of the society. This per capita reducing-power depends upon inventions, upon scientific discoveries or the equivalent. Yet, these discoveries cannot be adequately realized unless the potential rate of growth of the economy is adequate; there must be a reasonably high ratio of surplus energy to total energy throughput per capita.

The result is that the per capita throughput must rise, but under the condition that the ratio of surplus also rises. (The reasons are given more fully in *The Theory of the*

European Monetary Fund.) This combined exponential growth in both the per capita throughput and the rate of surplus correlates with negentropy.

This is the reference-background for presenting an adequate view of Plato's notion of the higher hypothesis.

Realization of Negentropy

The realization of negentropy, on which the sustaining and advancement of the human condition at any level depends, is mediated by that quality that distinguishes man from the beasts: the development of the creative-mental potentials of the human mind. Every beast is delimited to a range of alternative behavioral potentialities, whose thermodynamic potentialities are relatively fixed by the beast's heredity. Only man can develop himself without biological transformation of his hereditary nature; only man can develop his mind.

Not only is technological progress indispensable for successful human existence. Without technological progress man is degraded in implications of general social practice to a kind of talking cattle. Man in zero-technological-growth or devolving cultures is degraded in self-image and morality to likeness to a mere talking beast. His sensual appetites and impulses dominate his sense of what his identity is. He becomes sensualist-irrationalist—Hobbesian, beastlike man.

The beastlikeness of mankind is expressed as simple consciousness, as a set of fixed habits of conscious thought. In this mode of bestialized mental existence, the individual is enslaved to whatever impulses, prejudices, or judgments erupt into his consciousness. He knows not whence they come, nor can he prove whether they should or should not exist at all. They are simply there at the time they occur to him; he is the slave of their occurrence.

Creative development signifies changing the way one thinks. This is accomplished through what is formally represented as the method of the Platonic dialogue. One sets one aspect of one's mental processes to watch the other in the conduct of a dialogue with other persons. By watching the interplay of simple consciousness, the watch-
ing part of one's mind is able to correct the systematic errors in the process by which simple consciousness is determined.

These changes correspond to *ordinary hypothesis*. By changing the criteria of simple consciousness's generation, one becomes rational (in the ordinary usage of the term rational). This higher faculty of mind, the "watcher," the conscience, is the source of hypothesis.

There is a second level to this process. In the history of scientific knowledge, each level of such knowledge is qualitatively superseded by new general advances in knowledge. Therefore, it is demonstrated that any science, in the conventional notion of an accredited body of scientific knowledge, is intrinsically inadequate. As a level of scientific knowledge corresponds to a level of development of the power to generate scientific hypotheses, so the progress of scientific knowledge describes a succession of levels of quality of formulation of hypotheses.

For this condition we must assign to our mind the function of developing a "watcher" who watches the

"watcher." The hypothesis that coherently and efficiently governs qualitative advancements, successively, in the quality of scientific hypotheses is the *hypothesis of the hypothesis*, or Plato's *higher hypothesis*. This is coordinate for physics as such with Riemann's *fundamental hypothesis*.

The Commedia

Perhaps the most efficient example is Dante Alighieri's *Commedia*. The *Commedia* is apportioned into three sections: Inferno, Purgatory, Paradise. In the first section, Inferno, Dante's consciousness is simple consciousness. He is reacting only to an ordering of successively ordered experiences, governed by the principle of sensuality. In the second, Purgatory, he hypothesizes. He questions, he is rational in the ordinary usage of rational today. In the third, Paradise, he is developing the hypothesis of the hypothesis.

The principle that orders the successive cantos in the Inferno is the principle of irrational sensual appetites and impulses. This leads to its outcome, the Pit. The Pit negates the validity of irrational sensuality. In Purgatory, Dante becomes Kantian man. He still adheres to the service of his sensual appetites, but he takes into account the chains of cause-and-effect that an action detonates in the world around him. Those actions that have undesirable consequences he suppresses (negates). He uses this negating knowledge to curb or modify his appetites and impulses. This leads him to the futility of the Earthly Paradise. Dante must give up altogether the notion that his sensual appetites and impulses are his identity. It is not adequate merely to employ rationality in seeking successful gratification. He must give up the association of his identity with such sensuality. That change is like passing through fire. Paradise is the method of developing the higher hypothesis.

Each division is composed of 33 successive cantos, ordered by a developmental principle. In the first, the Inferno, the developmental principle is sensuality, irrationality—existentialism. In the second, Purgatory, the developmental principle is Kantian: *the rational negation of counterproductive sensual impulses in order to save those that understanding hopes to satisfy from among the noncounterproductive*. In the third, Paradise, reason-for-itself is the developmental principle.

Yet, the succession of the three developmental principles also implies a developmental principle governing the entire succession of the cantos, from the first of the Inferno to the last of the Paradise. In the last canto of the Paradise, this higher, overall developmental principle is finally comprehended. The journey to the empyreal, knowledge of the content of the higher hypothesis, is now completed. That canto is the perfected knowledge of the implications of the higher hypothesis.

Universal Law

The significance of the higher hypothesis is that it correlates uniquely with the fundamental aspect of human progress in willful mastery of the lawful ordering of the universe. Scientific knowledge, in the ordinary sense, cannot be in correlation with the lawful ordering of the

universe, except *inadequately*. Man could not imagine mastering the laws of the universe in any final, all-at-once moment of glory, with nothing more to learn. Man knows he is mastering the ordering of the universe only by abstracting that aspect of his creative behavior that correlates with successive advances in mastery of the universe. The epistemology of scientific knowledge's evolutionary progress, viewed from the vantage-point of the notion of the higher hypothesis, is the higher form of knowledge man can attain concerning universal law.

It is on this account that Riemann's notion of fundamental hypothesis is fundamental for physical scientific knowledge.

Conversely, to produce the highest incidence of scientific discoverers, we must have a general culture that fosters progress of developing new citizens toward comprehension of the higher hypothesis. This must be a culture in which the principles of the Platonic dialogue, as a method for reaching the higher hypothesis, dominate in all aspects of cultural development: the arts, science, law.

Self-Critical Cultures

Clearly, the most widespread obstacle to development in Africa is the attachment sections of the population have to "our ancient ways," "our special customs," or simply, "tradition." The "traditional culture" of sections of populations long enslaved to technological stagnation, especially in rural and pastoral life, is intrinsically a culture belonging somewhere in Dante's Inferno, a culture tending to the same degree of moral degeneration as the world-outlook and prejudices of Europe's fanatical environmentalists.

However, fortunately or unfortunately, that is the culture that seizes many. It cannot be simply leapt out of. The African burdened with such a culture cannot step into a European-type rationalist culture by an effort comparable to moving abruptly into another room. Like the character Dante, this African must struggle within the culture imposed upon him from the past, making his way out of the Inferno, into Purgatory, toward Paradise. It is that struggle to make his way upward that is the heart of the new African cultures to be developed.

The practical questions that confront us most prominently are, therefore, two. Most broadly, we must set cultural progress of the sort we have outlined into motion. Concomitantly, Africa must use the lessons of the Platonic-Neoplatonic method to organize the movement.

From Tradition to Evolution

We set progress into motion by providing a climate of the benefits of technological progress. We afford the most backward peasant a credible experience of the benefits of progress. The benefits that are important to him will make the kind of thought necessary to comprehend the new practices a desirable quality of mental activity. "I have learned a new thing that increases my power over my circumstances of life." As that interest in changing his simple consciousness is established circumstantially, it is the work of the educator and the artist to employ the method of the Platonic dialogue to transform the existing

cultural ingredients from a simple-conscious traditional form into the subject-matter of a new culture—a consciousness of the changing of and going away from simple-conscious traditional culture.

The moral shift that must be fostered is not one of repudiating one's ancestors pure and simple. In superseding old ways, one fulfills the existence of one's ancestors by making something better on the foundations they have provided. "Thank you for having given birth to my parents, dear ancestor. Now, through progress—through progress in change—I shall prove that your having lived made possible something worthwhile." The developing African says, "Because of the progress I bequeath to my posterity to build upon, I ensure that my ancestors have not lived for nothing."

Let us now distinguish the essence of the matter of culture.

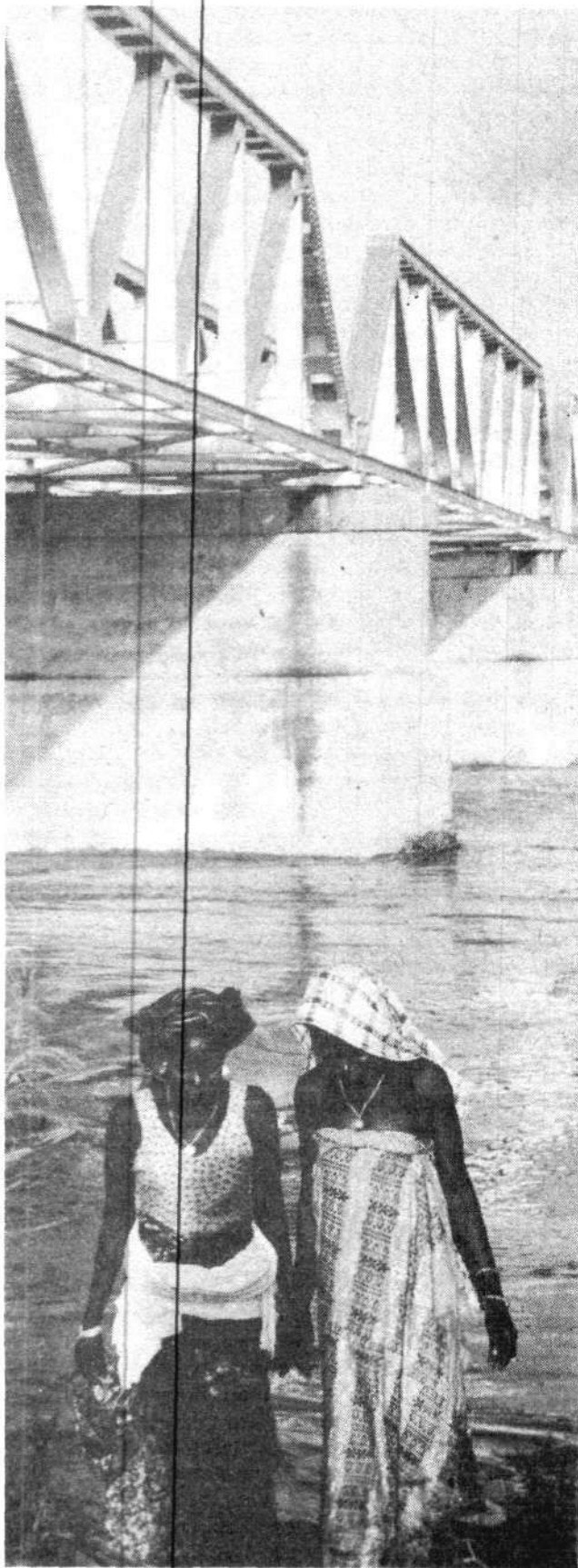
From the standpoint of ignorant opinion on this matter, culture is a set of beliefs and so forth, as a kind of collection of objective-like artifacts. In reality, *culture is the notion of a process of development*, by which progress in knowledge and method of developing knowledge has been effected up to each point of that process of development. Cultural knowledge becomes more profound as the process is understood as a process of progress in the quality of developing new knowledge, as the process represented by that qualitative progress is abstracted from the whole experience to become the subject of reflection.

Culture in Africa will become Platonic dialogues that embody the Platonic method of superseding present-day traditional beliefs. This will be generalized, to make emerging African culture an integral part of world culture by comparing the experience of transcending traditional beliefs in Africa with equivalents in the progress-phases of European and other cultures. This critical comparison will provide the basis for the generalization of the notion of culture as *human culture*, rather than as European, African, or any other narrow definitions in this domain.

The incapacitating problem for the European generally in dealing with the more stubborn social aspects of African development, will be that most Europeans today accept in their own cultures a mixture of good and rubbish. The acceptance of a rubbish-laden European culture (for example, toleration of existentialism, empiricism, and so forth) as a collection of "givens," a collection of "personal preferences," simple-conscious "given" prejudices and beliefs, means that the European so afflicted is necessarily blinded to the important features of African cultural development, to the effective comprehension of the important problems that tend to impede that development. If the European does not subject his own beliefs and

"We set progress into motion by providing a climate of the benefits of technological progress. We afford the most backward peasant a credible experience of the benefits of progress. The benefits that are important to him will make the kind of thought necessary to comprehend in the new practices a desirable quality of mental activity."

Here, two Hausa women walk by a Nigerian railway bridge.



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habits of judgment to the rigors of the Platonic dialogue as a method, that European is a crippled person in the domain of dealing with the realities of Africa.

An Elite of Platonic Thinkers

For this purpose, Europe and Africa must produce an elite. This should not be an elite in the sense of a privileged stratum squatting on the shoulders of the less favored. It must be an elite of servants, an elite of the dedicated modern agents of the Platonic Academy at Athens. Each of this elite must master one or more of the relevant fields of science, engineering, medicine, poetry, music, drama, sculpture, architecture, and agronomy. That person must be developed in the Platonic method and must master his or her own field from that vantage-point. Such persons, distributed among the political, industrial-research, artistic, and other aspects of government and work in the mediating of technology transfer, serve as the radiating-points for mediating the point of view, the approach we have reviewed in outline in this presentation.

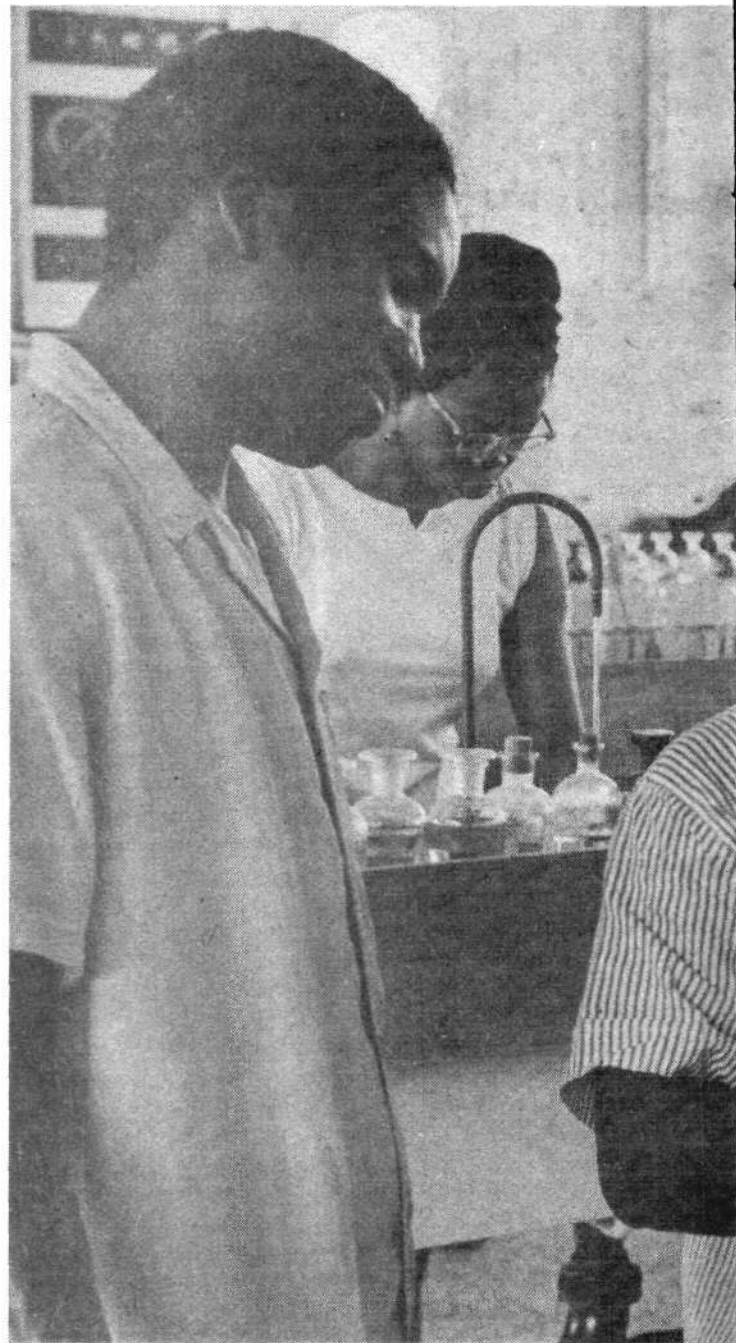
This elite must be developed with aid of new special institutions of advanced education governed by Platonic-Neoplatonic principles. These institutions catalyze the development of the needed elite and also serve as catalysts for introducing needed reforms into educational institutions in both the presently industrialized and developing nations.

The process in which we are engaged is no mere economic-development program, not merely a remedy for the hazards otherwise threatening mankind in this time. We are engaged, if we see the matter rightly, in a battle to finally solve the problem of the "hinterlands." We are working to place the present and future order of this entire globe under the rule of the Grand Design.

True, we are working to uproot the preconditions of chaos, famine, and epidemic in the developing sector, and to ensure the prosperity of all nations in a half-century effort to end forever underdevelopment in any significant corner of the world. This aspect of our endeavor is necessary, but not the essence of the undertaking.

We are transforming the minds of ordinary people in both the industrialized and developing nations. The process of global economic development and technological progress provides the indispensable environment in which to foster consciousness of scientific and technological progress, especially consciousness of the development of the creative potentials of the individual mind. We are engaged in affording mankind generally a new, higher valuation of itself with aid of this new technological environment.

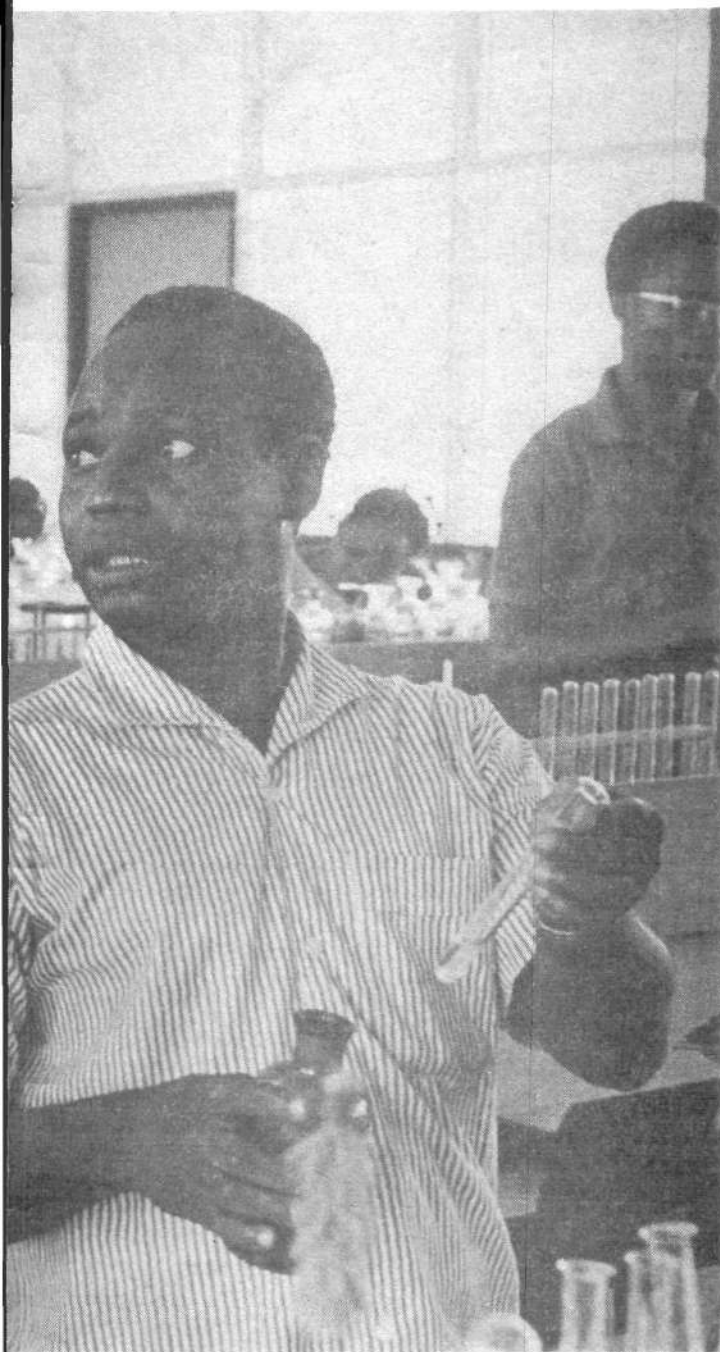
Yet, to consolidate the effects of these beneficial circumstances upon the mind, the methods and implications of the Platonic dialogue must be consciously applied to science and art, to catalyze within the individual mind a rounded development. We cannot sustain progress in an environment permeated with cultural barbarism; we cannot sustain a viable artistic life among a people in technological barbarism. The principles of great art and the



"Europe and Africa must produce an elite...developed with aid of new special institutions of advanced education governed by Platonic-Neoplatonic principles."

principles of great science are epistemologically the same principles.

"How to" education in practical technology is perhaps unavoidable. Our universities being in the lamentable condition they now represent, much of the education afforded will be poor in methodology, as stultifying of the development of creative powers as it is informative for



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Above, an instructor in the laboratory of the Federal Advanced Teachers College in Lagos, Nigeria teaching qualitative analysis.

technological practical tasks on a fixed level. We must ensure this to a certain extent, while working to supersede it, bypass it as rapidly as possible. We must infuse the process of development and grow to replace all the left-over refuse we carry into the initial phases of the present great undertaking.

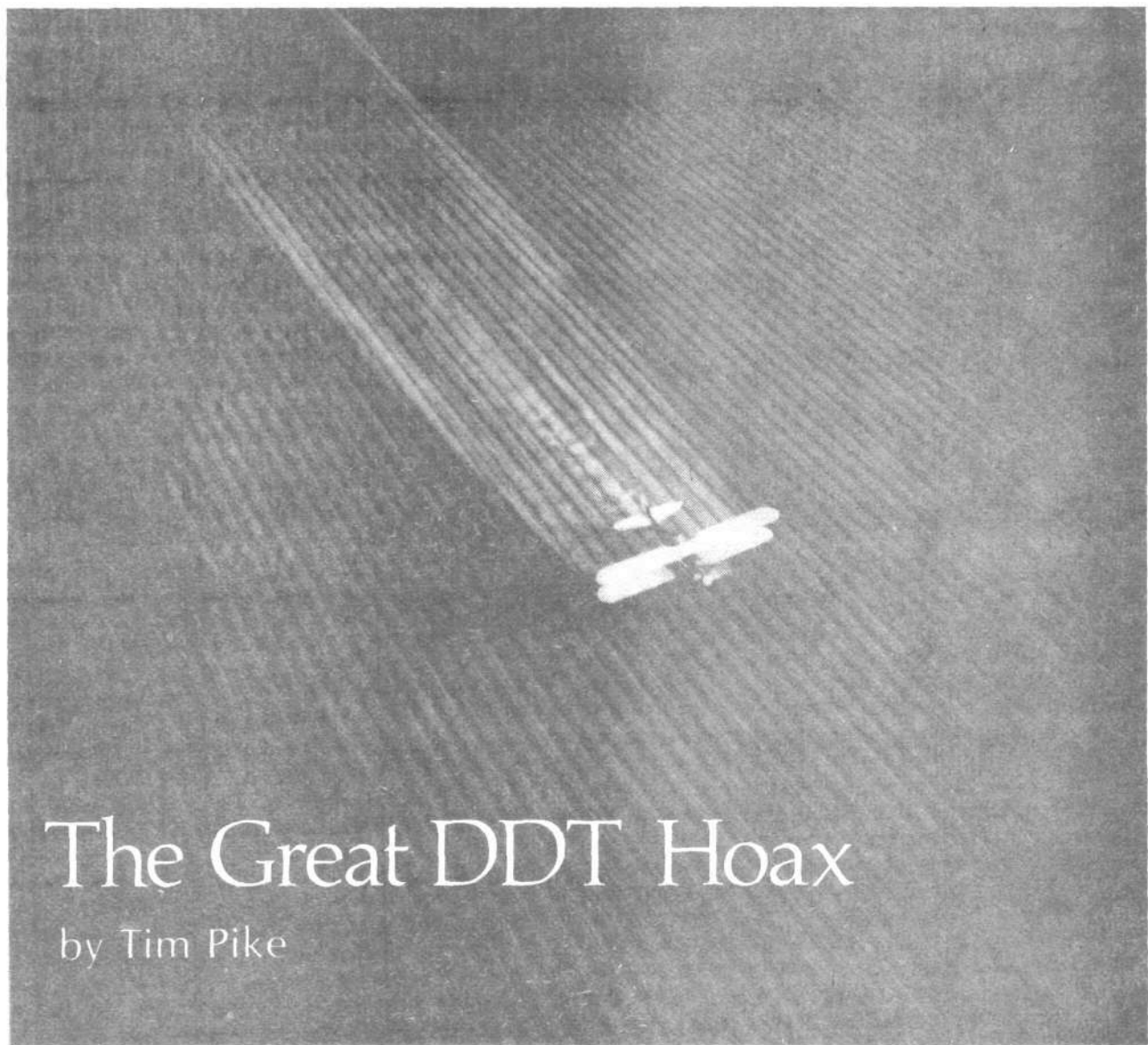
It is seeing what we term *art* as properly ruled by the

higher hypothesis that is key to fostering the most rapid advancement of the scientific and technological powers of labor in Africa and other zones of economic development.

Lyndon H. LaRouche, Jr., a noted economist, is the author of innumerable articles and three books, *Dialectical Economics*, *The Case of Walter Lippmann*, and a forthcoming autobiographical work, *The Power of Reason*. LaRouche is the national chairman of the U.S. Labor Party and its presidential candidate for 1980.

Notes

1. Heinrich Schliemann (1822-1892), an archaeologist and linguist, discovered the site of Troy at Hissarlik, Turkey on the basis of his hypothesis that Homeric epics were historical documents as well as artistic masterpieces. Using this and other discoveries, including major Mycenaean excavations, Schliemann opened an entire chapter to knowledge of the history of the Bronze Age, a chapter previously regarded as closed. Almost entirely self-educated (he taught himself nearly 20 ancient and modern languages fluently as an adult), Schliemann was vilified during his entire scientific career and his discoveries were ridiculed or discounted by "new dark age" proponents of the "mythical character of Homer." Schliemann published a dozen books, in French, English, Russian, and in his native German. Born in Germany, he became a citizen of Russia and later of the United States, whose rapid industrial growth Schliemann staunchly supported.
2. The Guelph (Welfen) were originally a bucolic German aristocratic house, associated with the rule of Franconia, with branches in Italy. During the 11th century, through an alliance among Roman banking families centered around the Pierleoni, the oligarchical faction of the present millennium acquired the name Guelph by the marriage connection of Matilda of Tuscany's House to the Welfen house. In the course of developments following the Guelph defeat of the Hohenstaufen House (Frederick Barbarossa through Frederick II) during the events of 1266-1268, the Guelph-Ghibbelline disputes arose. In the internal struggles within Italy and elsewhere at the onset of the 14th century, the Italian branches of the Guelph aristocracy split into a "White Guelph" and a "Black Guelph" faction, the former won to the humanist policies otherwise associated with the Ghibbelline faction. Dante Alighieri was a leading thinker for the former faction. From the early 14th century, the antihumanist oligarchical faction of Europe has represented the continuity of the Black Guelph faction of Dante's time. See this author's "The Secrets Known Only to the Inner Elites," in *The Campaigner*, May-June 1978.
3. Lord Palmerston, as British foreign secretary in the 1840s and later prime minister, was instrumental in founding the feudalist-romantic Young Englander movement in Britain and similar movements throughout Europe—Young Italy, Young Turkey, Young Russia, and so on. These groups, along with Palmerston's establishment of Scottish Rite freemasonry cults across the globe, served as an intelligence arm for the British.
4. *The Theory of the European Monetary Fund* was published in Oct. 1978 as a supplement to the *Executive Intelligence Review*.
5. See, for example, "Draft Proposal for a Heinrich Schenker Foundation for Musical Science," by Peter Wyer, *The Campaigner*, Aug. 1978; and "Think Like Beethoven," by Anno Hellenbroich, *The Campaigner*, Feb. 1978.
6. For a discussion of the harassment campaign against Bach by the British Royal Society and the related literary association, the Kit Kat Club, see "The Secrets Known Only to the Inner Elites," *The Campaigner*, May-June 1978, pp. 60-62.
7. See "Riemann Declassified: His Method and Program for the Natural Sciences," by Uwe Parpart, *Fusion*, March-April 1979.



The Great DDT Hoax

by Tim Pike

WHEN THE U.S. Environmental Protection Agency banned the use of DDT in June 1972, it issued a death sentence to the Third World, condemning millions of people to suffer and die from the debilitating diseases that DDT had brought under control.

The EPA acted on the basis of a "Big Lie" manufactured by the fledgling environmentalist movement and its zero-growth sponsors. Their Big Lie then—that DDT is a killer—was similar in form to their propaganda today that equates nuclear power with cancer. In both cases, the assertion of a known fraud often and widely enough begins to make the public doubt the truth.

In fact, there is *no* scientific evidence that warrants the banning of DDT. As the U.S. Public Health Service noted in its recommendation to the EPA Sept. 9, 1971: "The known health hazard from DDT is essentially zero. Examined in this light, the benefits to mankind from the use of DDT for the control of malaria far outweigh even any

potential hazard, on the basis of our total accumulated knowledge regarding DDT."

Long-term studies have shown that DDT is so safe to humans that doses 100 times as strong as those that occurred in periods of widespread DDT use have had no ill effects. Equally demonstrable, the consequence of the ban was an immediate rise in death and debilitation from the human diseases that DDT had effectively controlled—malaria (the world's greatest disease problem), typhus, plague, yellow fever, encephalitis, spotted fever, sleeping sickness, and others.

The EPA and the environmentalist supporters must be held accountable for their deliberate crime: There was not a single human death from DDT usage; there have been untold thousands of deaths, millions of disease-stricken persons, and an incalculable loss in human potential, as a result of the DDT banning.

As I shall show, the so-called facts mustered to convince

the public that DDT was lethal were contrived and then blown up into scare headlines by the media. The persons responsible readily admit why they would conduct such a hoax; in their world view, people are a problem and the world is better off without them. In the same way, they feel that the world would be better off without advanced technology, mechanized farming, and the U.S. agribusiness industry that has helped feed a growing world.

This view that "small is beautiful" and that the world would be better off if half the population were killed off is not new. Malthus said it. The New Dark Ages crowd around H.G. Wells and Bertrand Russell said it. And today, the World Bank and the International Monetary Fund policies for the Third World are out to ensure that it happens. The banning of DDT was not just a mistake but part of this murderous policy.

The antigrowth forces behind the Big Lie used the DDT issue to build a Malthusian environmentalist presence in the United States. They attacked DDT specifically because it represented the leading edge of the scientific-technological means of dealing with age-old human afflictions and eradicating the pests responsible for the mass destruction of crops and forests. As official statistics from governments, the United Nations, and health agencies show, DDT use had helped control disease so effectively that entire populations were freed to realize productive lives. Similarly, DDT contributed to insect control so effectively that in some areas of application, food production increased by more than 40 percent.

In the Asian subcontinent, for example, DDT use had virtually cleared the mosquito out of this so-called indigenous malaria area. In 1961, Pakistan reported 7 million cases of malaria. After an aggressive spraying and treatment program, the disease was reduced to 9,500 cases by 1967, almost a 1,000-fold decrease. After a ban on DDT use, the malaria toll had climbed to 10 million cases by 1975.

The story is the same for India and Sri Lanka, where DDT production was stopped after the environmentalist onslaught here and the increased price of petrochemicals following the 1973 Mideast war. India brought the number of malaria cases down from an estimated 75 million to about 50,000 in 1961, after a vigorous DDT campaign. From 1961 through 1963, there were fewer than 100,000 cases in the entire country, but by 1977 "according to some estimates, the number of malaria cases reached at least 30 million and perhaps 50 million."

What this means for the future of the Asian subcontinent and the rest of the world where malaria saps the strength of the population is exemplified by the reports from Cambodia under the recently deposed Pol Pot government. In 1976, the government reported that the country was unable to harvest its rice crop adequately because more than 80 percent of the workforce had been "worn out" by malaria.

The mortality caused by malaria varies considerably, depending on the standard of living, nutritional levels, and the specific type of malarial infection. (There are four major types of malaria-causing organisms that differ widely

in the severity of the disease.) Anywhere from less than 1 percent to more than 20 percent of the individuals infected by the disease-carrying mosquito will die from the malaria. Additionally, for every one death due directly to the malaria, it is estimated that there are five deaths from other causes that result from the weakened state.

To take another example closer to home, the nonusage of DDT to destroy the bollweevil in southern cotton areas has been calculated to have cost more than 450 million pounds of cotton in lost yields. Similar calculations could be made for cereals, vegetables, and fruits.

The Fraudulent Evidence

The environmentalist attack on DDT was based on three main arguments: the predicted mass die-off of the bird population, the allegation that DDT can never be eliminated from the environment, and the charge that DDT causes cancer.

Most incredibly, the Environmental Protection Agency banned DDT after months of hearings in which reputable U.S. and world health agencies all testified against the ban, presenting sound scientific evidence (see box). On the other hand, the environmentalists presented evidence characterized by poor experiments, dubious theory, and just plain lies.

Birds

One chief environmentalist myth was the allegation that DDT was causing massive die-offs of bird life, especially those birds high on the food chain.

Rachel Carson: Let Nature Rule

Like the scare stories about the Three Mile Island nuclear plant, Rachel Carson's dire predictions in the 1962 bestseller *Silent Spring* were based on fiction, not fact. Nevertheless, the book's impact was to get the machinery rolling that eventually stopped DDT. In Carson's view, man exists for the convenience of nature, and the certain silence of the human victims in the Third World took secondary place to the projected silence of the American robin. She concludes *Silent Spring* with this paragraph:

The "control of nature" is a phrase conceived in arrogance born of the Neanderthal age of biology and philosophy when it was supposed that nature exists for the convenience of man. The concepts and practices of applied entomology for the most part date from that Stone Age of science. It is our alarming misfortune that so primitive a science has armed itself with the most modern and terrible weapons and that in turning them against the insects it has also turned them against the earth.

Rachel Carson is responsible for the deaths of more people than is Adolf Eichmann.



We got started by stopping DDT.

In 1973 we won our six-year struggle.
The pesticide DDT was banned in the
United States.
We started the fight with no money, no
office, no staff.
But we had an idea: that scientists and
attorneys—working together—could strike
telling blows for the environment.
Our triple-threat attack—thoroughly
researched scientific evidence, sound
economic analysis and persistent legal action—
worked.
DDT was out of the way and EDF was
on the way.
Over a dozen years, EDF has pioneered
other remarkable breakthroughs—in control
of toxic chemicals, protection of wildlife,
energy conservation, curbing air and water
pollution, noise abatement and more.
Today, when we file suit, polluters
cringe.
Because of the Environmental Defense
Fund, the environment is safer.
And so are you.

The Environmental Defense Fund got started by stopping DDT...as did malaria and famine.

This anti-DDT story was often modified to have greater credibility as follows: Birds were not being poisoned outright by DDT. Instead, the DDT interfered with bird reproduction by causing them to lay eggs with thin shells. These shells were so fragile that the eggs would break or otherwise fail to incubate the embryo, resulting in, at best, frail chicks and in extreme cases wholesale reproductive failures.

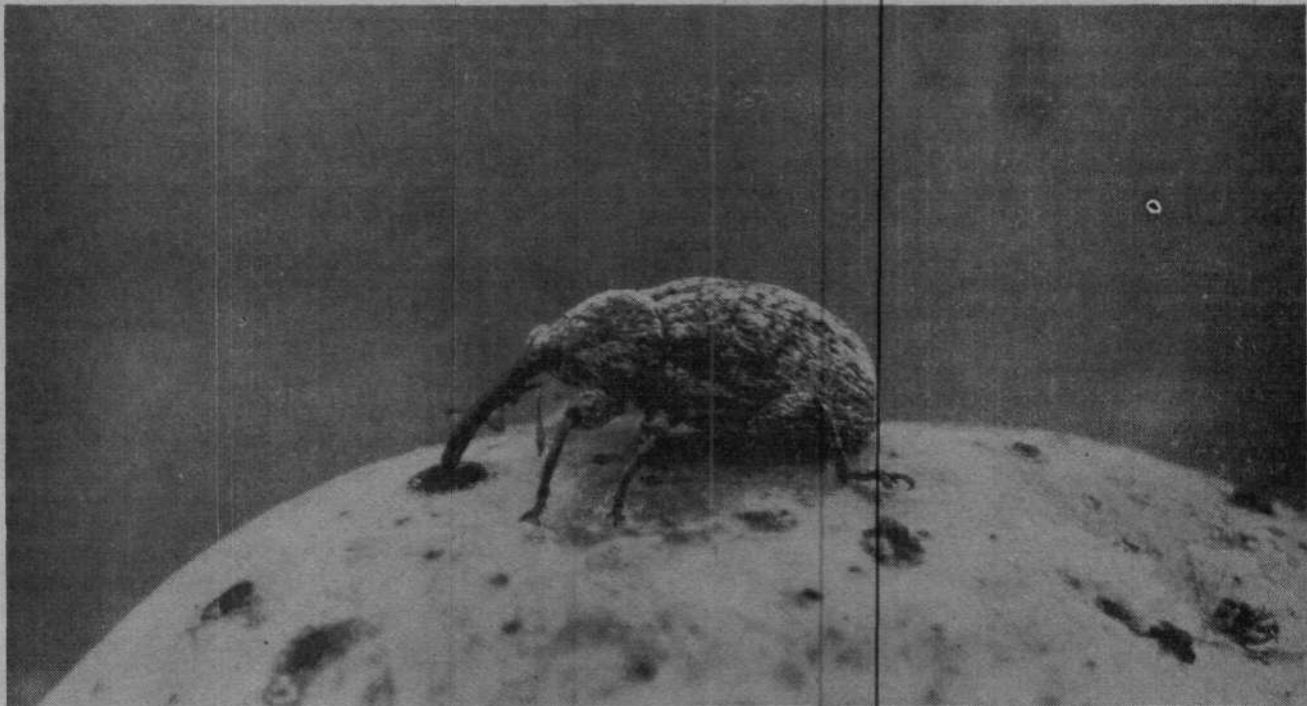
The facts are just the opposite. The success of most bird species during the DDT years is obvious to anyone who spends much time outdoors. Judging from the widespread increase in numbers of birds that live near human habitation, our modern pesticides would appear to have actually aided the birds rather than harmed them. The annual Christmas Bird Counts of the Audubon Society indicated that between 1941 and 1961 (the heaviest years of DDT usage) there was a noticeable upward trend in most kinds of birds. These censuses showed an increase per observer of 12 times more robins, 21 times more cowbirds, 38 times more blackbirds, and 131 times more gackles.

Other accounts documented great swarms of these birds and many more across the country. Gulls became so abundant on the East Coast that the National Audubon Society sought and obtained permission to poison 30,000 of them on Tern Island, Mass. in 1971. The bird that wildlife defender Rachel Carson claimed was doomed—the robin—became the most abundant bird in North America during this period. Blackbirds threatened to wipe out the corn crop in northern Ohio and other crops that were right near DDT-sprayed marshes in the southeastern United States. Wild turkeys increased from their rare status of the pre-DDT years to such abundance that hunters were harvesting 130,000 of them annually; mourning doves became so numerous that more than 41 million were harvested in 1965 alone.

Despite the allegation that raptorial birds were threatened with extinction by DDT, most kinds became more and more abundant (except where human encroachment or dramatic changes in habitat discouraged them.) At Hawk Mountain Sanctuary in Pennsylvania, the records indicate a steady increase in migrating hawks, culminating in more than 29,000 counted in 1969 and more since then. The number of ospreys in the same area climbed from 200 in 1945 to more than 600 annually by 1970, even while the anti-DDT groups were shouting that DDT had doomed the osprey to extinction.

Bald eagles also continued to increase in most rural areas, and the Audubon Society belatedly acknowledged that in 1970 there were 208 resident bald eagles in Montana, rather than the presumed 130. In 1969, the rangers in Glacier National Park, Montana counted 373 bald eagles along tiny McDonald Creek in half a day! In California the white tailed kite experienced a tremendous population explosion all during the very heaviest years of DDT usage.

But the anti-DDT activists continued to publicize their concern about bird life even while flocks of so-called endangered species darkened the skies and hunters had



A chief beneficiary of the DDT ban: The U.S. bollweevil.

Source: U.S. Department of Agriculture.

DDT— The Facts

DDT, dichloro-diphenyl-trichloroethane, belongs to the family of pesticides known as chlorinated hydrocarbons. Its technical name is 1,1,1-trichloro-2,2-bis(*p*-chlorophenyl)-ethane (C₁₄H₉Cl₅).

Although its half-life (decay time) in soil is seven years, on fruits and vegetables it is only days. For example, for lettuce, 2 days; peaches, 10; clover, 13; alfalfa, 6; citrus fruit, 35.

DDT is a contact insecticide that, by penetrating the external body surface (the cuticle) of the insect, acts as a nerve poison and kills rapidly. Its leading effectiveness in malarial eradication programs is the result of its residual activity vis-à-vis its continu-

ous activity on the body of the insect.

Excessive amounts of DDT are harmful to fish, but DDT is not a potent fish killer. The pesticide dieldrin, for example, kills 10 times as potently as DDT.

DDT, which was developed out of government work on chemical warfare, was first used in 1939 to save the Swiss potato crop. During the war, it was used on a mass basis in the armed forces to kill body lice. In 1948, Swiss chemist Paul Muller was awarded the Nobel Prize for his role in developing the compound, but, even then, environmentalists like Rachel Carson were talking about its potential danger.

The Benefits of DDT

In addition to its antimalarial effectiveness, DDT is also effective in controlling louse-borne typhus, plague, and urban yellow fever—diseases that have been the most important epidemic diseases throughout history. DDT also controls more than 20 other significant diseases, especially in underdeveloped countries.

DDT has a major effect on controlling crop losses caused by insects. The importance of this loss can be seen in the following figures. For Central

America, South America, Africa, Asia, and Europe, crop losses because of insects are: cotton, 18 percent; rice, 39 percent; grain, 5 percent; corn, 17 percent; vegetables, 10 percent; and sugar cane, 40 percent. In addition, it is estimated that agricultural production increases as much as 40 percent where malaria is controlled.

The crop gain from DDT is phenomenal. I quote from Wayland J. Hayes, Jr. in *Toxicology of Pesticides* (Baltimore, Md.: Williams & Wilkins Co., 1975):

“When DDT was introduced, there was an unprecedented increase in the production of those crops on which it was used, and the increase corresponded to the degree of its use. Crops such as cotton, peanuts, and potatoes, on which pesticides are used most extensively, showed gains ranging from 68 to 119 percent. The production of alfalfa seed increased from 300 to 600 percent in states where the crop was treated intensively with insecticides, but remained essentially stable in states where the crop is raised for hay and, therefore, receives little treatment with insecticides.”

longer seasons and larger bags year after year. And the media continued to pump the environmentalist nonsense that DDT was killing off birds into the heads of the U.S. public—and the scientific community—despite the plain facts to be observed overhead.

Lies

Lying about scientific evidence was a primary technique in the environmentalist battle against DDT. The widely read precedent for this goes back to Rachel Carson and her landmark 1962 book *Silent Spring*, a sort of wildlife bible. "When DDT was introduced into the diet of Japanese quail, few eggs hatched," Carson wrote. To back up her statement, she cited a 1956 article by J. B. DeWitt, "Chronic Toxicity to Quail and Pheasants of Some Chlorinated Insecticides," in *Agriculture and Food Chemistry* (vol. 4, no. 10, pp. 853-66).

What to most credulous readers must seem like the epitome of academic style, however, turns out to be a remarkable bit of deceit. For those who bother to check out the DeWitt article, they will find that this is not at all what the article says. On page 865, Table 3 explains that the amount of DDT introduced into the quail diet was 200 parts per million during the reproduction period (the average human intake during the DDT years was 0.0005 parts per million) and that 80 percent of these quail eggs

hatched compared to 83.9 percent of the eggs laid by the control group. The reader also will find that 92.8 percent of the eggs from the DDT-fed birds were fertile, compared to only 89 percent of the eggs from the control group.

These weren't the only data Carson left out of her book. Table 4 in the DeWitt article, on the same page, notes that pheasants fed DDT experienced a great increase in the survival rate of their chicks. Pheasants fed 50 parts per million of DDT throughout the year hatched 80 percent of their eggs, while the control birds hatched only 57.4 percent. Furthermore, after two weeks, 100 percent of the DDT birds survived, compared to only 94.8 percent of the control group.

Carson had many successors in this data-falsification technique, even those in the science community. Bitman et al., for example, published an article called "DDT Induces a Decrease in Eggshell Calcium" in *Nature* magazine in 1969. In this phony experiment, Bitman claimed that Japanese quail laid eggs with thin shells as a result of feeding the birds DDT while they were on a "calcium stress diet." Both experimental and control birds were fed 0.56 percent calcium as opposed to the 3 percent calcium a normal diet would include, and the experimental birds were fed a concentration of DDT about 100 times that normally available in the wild. The "statistically significant"

The Overwhelming Scientific Support for DDT Use

Dr. Philip Handler
President

National Academy of Sciences:

"DDT is the greatest chemical that has ever been discovered. The second generation of pesticides is a darn sight more dangerous than DDT, but because of the public outcry the government has needlessly banned DDT for most uses.... The predicted death or blinding, by parathion, of dozens of Americans last summer must rest on the consciences of every car owner whose bumper sticker urged a total ban on DDT" (*Science*, Jan. 15, 1971).

Dr. Thomas H. Jukes

University of California, Berkeley:

"The issue of banning DDT is unquestionably a genocidal one. ... The balance is overwhelmingly in favor of DDT. ... I refer you to the monumental bibliography of 3,404 references

on DDT compiled by the Division of Biology and Agriculture" (letter to the editor of *Science* magazine).

Clifford M. Hardin

Secretary of Agriculture:

"DDT is an indispensable weapon in the arsenal of substances used to protect human health and has an amazing and exemplary record of safe use.... The total value of DDT to mankind is inestimable, and is comprised of nutritional, economic, and social benefits.... Not one of five distinguished committees of professional scientists that have studied pesticides has recommended or intimated that DDT use should be summarily banned. These groups include the President's Science Advisory Committee, the Committee on Persistent Pesticides, Division of Biology and Agriculture of the National Academy of Sciences, the

Secretary's Commission on Pesticides and Their Relationship to Environmental Health, the Council on Occupational Health, and the Council on Environmental and Public Health of the American Medical Association" (brief to U.S. Court of Appeals in Washington, D.C., Aug. 31, 1970).

Dr. Jesse L. Steinfeld
Surgeon-General

U.S. Public Health Service:

"DDT has been instrumental in literally changing the course of history for many nations and continues to do so today. Its use ... has meant the difference between hunger, despair, and poverty, and food, hope, and the promise of a better life to billions of people throughout the world. ... Few drugs can claim to have done so much for mankind in so short a period of time as can DDT" (testimony before the Environmental Protection Agency, Sept. 9, 1971).

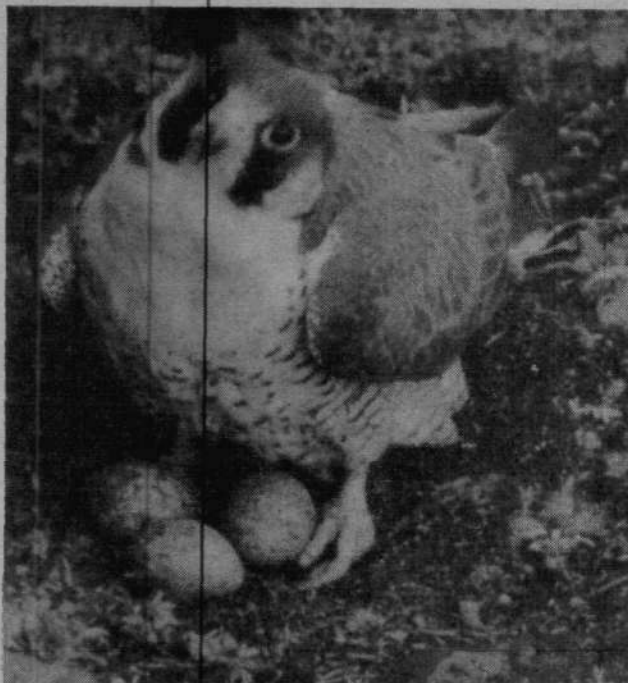
Special Report of the United Nations Food and Agriculture Organization:

"With no cheap substitutes available, these [developing] nations will suffer crippling agricultural setbacks if they

difference claimed between the control group and the DDT-fed group was 0.07 percent.

Now, even ignoring the fact that the Bitman method for measuring calcium content is meaningless—he measured percentage of calcium against the total fresh egg weight rather than a percentage of the eggshell alone—the Bitman claim doesn't stand up. Once converted from the obscurely presented English measurements to the metric, the difference in eggshell thickness, which Bitman says he measured with a micrometer, is 0.007112 millimeter (7.112 microns) for one isomer of DDT tested compared to 0.009906 millimeter (9.906 microns) for the other (1 millimeter is 0.04 inch).

To give an idea of how very small these figures are, note that the last three digits of these figures are beyond even the resolving power of a light microscope. Thus, according to the design of this experiment, their inclusion is entirely at odds with what every college freshman learns regarding significant figures. Bitman's claim to have measured differences in eggshell thickness in the range of 7 to 10 microns would have been quite a feat if true because at the time of the experiments the very best micrometer could be trusted to be accurate only in the 50-micron range for a substance as compressible as eggshell—or even paper. How is it possible to have highly significant



A female peregrine falcon. Guarding her eggs from an environmentalist?

hastily follow the example of the United States in curtailing the use of DDT. ... The case against DDT has not been proved. On the contrary, the case for it, in controlling pests ranging from malaria-carrying mosquitoes to locusts to cotton worms, is well documented. ... The United States in 1967 manufactured 120 million pounds of DDT, of which it exported two-thirds, using 40 million pounds at home. ... DDT costs 15 cents a pound and prices of substitutes range from twice to six times that much. The latter are often more toxic. Many developing countries simply could not afford to switch" (*New York Times*, Nov. 29, 1969).

Dr. A. J. Lehman

Director of Pharmacology

U.S. Food and Drug Administration:

"DDT is not a carcinogen" (*Summaries of Pesticide Toxicity*, 1965).

National Academy of Sciences:

"It is estimated that in little more than two decades, DDT has prevented 500 million deaths that would otherwise have been inevitable" (*The Life Sciences*, 1971).

Dr. Hardin B. Jones

Professor of Medical Physics and Physiology

University of California, Berkeley:

"Of all the pesticides, DDT is the safest. At high levels it is destroyed rapidly by body tissues; at low levels it is metabolically inactive and harmless, simply dissolved in body fat" (*Los Angeles Herald Examiner*, Feb. 12, 1970).

Dr. Lee A. DuBridge

President Nixon's Chief Scientific Advisor:

"My view is that DDT is still an extremely useful agent for many kinds of insects and pests, crop-killers and disease-bearing insects and so on. Banning it would have serious effects on human life, with the spread of disease and the destruction of crops" (*San Francisco Examiner*, Jan. 11, 1970).

Dr. Wayland J. Hayes, Jr.

Chief of Toxicology

U.S. Public Health Service:

"If we restrict DDT so as to interfere directly or indirectly with its availability and use in combating malaria, we

must accept responsibility for the suffering and death of thousands of people..." (testimony to Washington State Hearings on DDT, Oct. 1969). "The changes produced by DDT in the livers of rodents involved primarily the endoplasmic reticulum responsible for the formation of the microsomal enzymes of the liver; the changes are reversible; and the changes are peculiar to rodents. The changes are essentially identical with those produced by the drug phenobarbital ... and a number of other materials" (letter to Washington State Department of Agriculture Hearings Officer, Oct. 11, 1969).

Dr. Donald A. Spencer

(retired from U.S. Fish and Wildlife Service after 34 years):

"Statements are common that the half-life of DDT is 15 years or longer. ... These are very irresponsible statements. ... DDT is metabolized to less toxic, and finally to harmless compounds. In most cultivated croplands in the southern part of the U.S. the half-life of DDT is something less than one year" (1970 pamphlet, "An Ecologist Views the Environment").

differences of quantities that are too small to be accurately measured unless one is writing science fiction?²

Other falsified experiments made their way into *Science* magazine. In 1970, Scientist Peakall claimed that DDT prevented ringdoves from laying eggs, but his experiment was conducted under conditions—light reduction—that every poultryman and ornithologist knows would cause most birds to lay extremely thin-shelled eggs or stop laying entirely and moult.

In the same year, Porter and Wiermeyer announced in *Science* the same effect. They fed their birds a mixture of DDT and dieldrin, despite the fact that previous experimental work and field observations had indicated that dieldrin alone probably causes reproductive failure.

In one article, Porter was so anxious to prove DDT was a killer that results became "statistically significant" only when they happened to demonstrate what he set out to prove. For instance, a 46 percent loss of birds in the high-dosage group in 1967 is statistically significant, but a 58 percent loss of the control group in 1968 is ignored. As one honest reviewer pointed out, in these and other experiments, if the bird was part of a control group, its death was listed as routine or explained away, but if it was in the experimental group, its death would be listed as caused by whatever agent was under investigation.³

More Cracked Eggs

In addition to the environmentalists' falsification of data, there is the interference factor. By this I mean the following. Two bird populations have declined—the peregrine falcon and the California brown pelican. All the environmentalist reports blame DDT.

Of course, since the peregrine falcon population was declining in numbers prior to the invention of modern pesticides, it would seem silly on the face of it to suddenly blame DDT. Nevertheless, Cade et al. reported in 1971 that the peregrine population in Covilla, Alaska was having reproductive trouble induced by DDT.

Trouble indeed! Cade and his associates had spent the previous two years collecting fully one-third of the eggs one would expect the 13 pairs of birds under study to produce. And in 1969, precisely two-thirds of the expected

number of falcons were hatched. A result of DDT—or of these egg-snatching scientists?

An even more dramatic case hit the California brown pelican. At the first report of reproductive trouble among the pelicans on the island of Anacapa, concerned ecologists hit the island with everything they had. They repeatedly visited the island during nesting via helicopter, and, using shotguns, they collected adult pelicans that were sitting on their nests.

After two years of this experiment, it was announced that DDT had virtually wiped out the breeding colony at Anacapa. The concerned ecologists did not even investigate other possible factors such as the fact that the island had been surrounded by the Santa Barbara oil spill or the reported outbreak of the symptoms of Newcastle, a deadly fowl disease that had hit the mainland adjacent to Anacapa in the same period.

Since DDT has been banned, there has been a pelican recovery and a new decline.

DDT Forever

The charge that DDT never breaks down chemically has been demonstrated to be untrue in the years since the ban. Furthermore, there was plenty of evidence at the time of the anti-DDT fight that this was the case. Dr. Philip Butler, who gave testimony during the hearings that DDT would be with us forever, claimed not to know of the work of his own research colleagues at Gulf Breeze, Florida who demonstrated in 1969 that 92 percent of all DDT, DDD, and DDE broke down in seawater in just 32 days. In 1971, Butler was still shrieking that up to 25 percent of all DDT compounds ever produced were transferred to the oceans, where they remained forever.

Then, there is the case of Charles F. Wurster, secretary of the board of trustees of the Environmental Defense Fund and an associate professor of environmentalist sciences at the State University of New York at Stony Brook. Wurster and fellow Environmental Defense Fund scientist George M. Woodwell deserve the most credit for promoting the myth that DDT is with us forever. However, first one and then the other was forced to admit in testimony that their much-touted measurements of extremely high DDT residue levels in Maryland marshes did not reflect the general situation. Why? They had taken their first so-called alarming measurements at an isolated marsh site that just happened to be the spot at which the municipal DDT spray trucks cleaned their tanks.

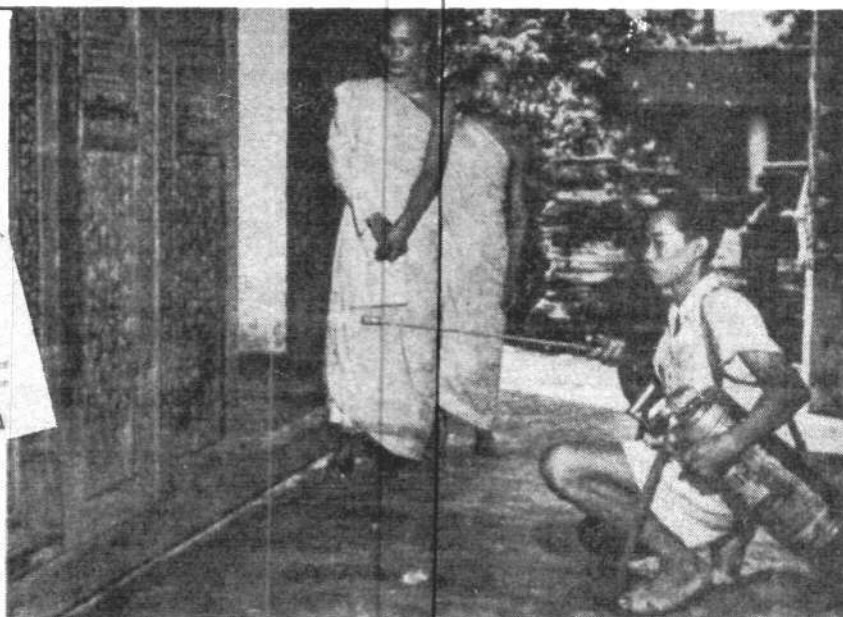
When pressed about why they had not taken measures to correct the mistaken impression created by their widely publicized preliminary results, the good doctor Woodwell claimed that he did not think it was necessary; and besides, he said, the Environmental Defense Fund lawyers had advised him not to mention his own published work proving the earlier results to be grossly exaggerated.

Cancer

The environmentalist charges linking DDT to cancer are generally an embellishment on a study that indicated that DDT can induce liver tumors in mice.⁴ But further investigations into this area have yielded some embarrassing

The Value of Pesticides

For every dollar spent on pesticides, \$4 in increased product is realized. An even more dramatic illustration of the importance of pesticides is in corn production. The contributions of hybrid corn and fertilizer use to corn production in Illinois increased the yield from 35 bushels per acre to about 50 to 55 bushels per acre. The subsequent use of soil insecticides brought the latter figure to well over 80 bushels per acre. If the United States were to revert to the production methods of the 1930s, the so-called natural method, the nation would require an increase of 76 million hectares of cropland and 272 million hectares of farmland to feed the population.



DDT and the Malaria Death Rate

Ceylon, now Sri Lanka, began an island-wide DDT campaign in 1947. By 1960, there were no deaths from malaria, and one statistical observer noted that malaria eradication contributed an estimated 60 percent of the rise in population growth since the war.

Above: DDT spraying in Thailand and a poster from an antimalaria campaign.

YEAR	MALARIA		BIRTH RATE	GEN. DEATH RATE	INFANT MORTALITY
	CASES	DEATHS			
1945	2,539,949	8,539	36.7	22.0	140
1946	2,768,385	12,587	38.4	20.3	141
1960	422	0	39.6	8.6	57

Source: *Journal of Ceylon Public Health Association*, Vol. 2, No. 96, 1961.

results for the environmentalists, for, in fact, there is reason to believe that DDT may be a cancer inhibitor.

Epidemiologically, there has never been shown a relationship between human cancers and exposures to DDT, despite a large number of workers who have been exposed to large doses of the chemical for a long period, going back over 30 years. Indeed, the federal government, which has been listing just about everything as carcinogenic or potentially carcinogenic, removed DDT from its list just this year.

As for the theory that DDT may be a cancer inhibitor: Certain birds seem to show increased longevity and reproductivity in areas heavily "contaminated" by DDT. Since these birds show fewer tumors, it is hypothesized that the DDT protects the birds from the carcinogenic effects of the aflatoxin (a potent carcinogen naturally produced by grain mold) present on the grain they eat. The theory is that DDT mobilizes hepatic enzymes that are capable of detoxifying aflatoxin.

As Hart and Fouts reported in a 1965 study:

This induction of liver enzymes is the most likely cause of lower rates of cancer among vertebrates that have ingested DDT. It may explain the increased populations of birds in the near marshes that have been sprayed with DDT, because the birds can temporarily detoxify aflatoxin which would otherwise produce cancers in the birds after they ingest those toxins with natural food.⁵

Other studies have shown similar effects, whereby DDT diminished the effectiveness of a substance's ability to induce tumors. For example, writing in 1972, Ottobone reported on feeding experiments conducted with four generations of dogs in an effort to induce DDT-related tumors:

There have been more reproductive failures and associated problems among the control dogs than there have been in the DDT dogs. As a result, the animal caretakers have dubbed the control group "the DDT-deficient dogs." The levels fed to the animals are, in reality, nearer to 1,000 and 10,000 times the quantities of DDT that Americans eat each day. We have examined every dog in the study that has finished its role in the project. As I mentioned earlier we have autopsied approximately 500 dogs. There have been no tumors related to doses of DDT.⁶

Indeed, the fact that DDT induces liver enzyme synthesis was the reasoning behind a physician's successful treatment of a human hepatic-failure using DDT as the medicine of choice.

When all these fraudulent arguments were said and done, the environmentalists then pulled out studies claiming that DDT wouldn't do any good anyway since mosquitoes had become resistant to the pesticide. Ironically, where resistance had developed, it came about because of the very premature cessation of the use of DDT as a



"Yes, Mr. Nader, DDT is definitely dangerous."

result of the environmentalists' efforts. The halting of DDT-spray programs before the elimination of completely susceptible malaria-carrying mosquitoes had the effect of reducing dosage to the mosquitoes below the lethal amount, thereby allowing them to survive and breed while exposed to sublethal doses. This led to the rise of resistant organisms in a few areas. Now, in order to eliminate malaria in these places, a more comprehensive and expensive program involving spraying with many chemicals as well as drainage will be necessary.

Once again, the environmentalist "cure" has led to a less healthy planet.

An American Scandal

The overwhelming evidence presented in the years that the DDT battle raged before the Environmental Protection Agency and in the courts said that DDT was safe and necessary. The great majority of the authorities on biological science, public health, and agriculture, and toxicology were strongly opposed to the DDT ban and said so, as did the chemical industry. As Dr. Philip Handler, president of the National Academy of Sciences, put it, the DDT decision was "a kind of national scandal, the basis for it political."

After several months of hearings the EPA examiner, Edmund Sweeny, ruled April 26, 1972 as a conclusion of

law that DDT was not a carcinogenic or mutagenic hazard to man. EPA Administrator William Ruckelshaus overrode this decision and ignored the thousands of pages of testimony. "Because of the importance of the case of the registration of the many uses of DDT I have decided to ... decide this case myself," Ruckelshaus said.

It was acknowledged by his staff (and evident from his decision) that he did not read the record of the hearings and paid no attention to the findings of the EPA examiner.⁸ On June 14, Ruckelshaus ruled that DDT was a "nonacceptable risk" because: (1) it is persistent in the environment; (2) it accumulates and becomes magnified in the food chain, therefore constituting an "unknown, unquantifiable risk to man and lower organisms"; and (3) it has harmful effects on phytoplankton, beneficial insects, freshwater invertebrates, fish, and birds, and is "a potential human carcinogen."

After issuing the order that banned DDT, Ruckelshaus issued an appeal on his personal stationery for funds for the Environmental Defense Fund, the group that had spearheaded the "kill DDT" campaign.

The DDT ban was the opening salvo in the continuing environmentalist war against industry, agribusiness, chemicals, and high technology in general. The fact that the ban was initiated and persisted—despite scientific evidence that shows clearly that DDT is a boon, not a hazard, to mankind—should be a sobering warning to the ostriches in the nuclear industry who think they can survive without fighting back.

The Fusion Energy Foundation representative in the San Francisco area, Tim Pike has a background in marine biology. His interest in the fight for DDT dates back to his college years at San José State University in California.

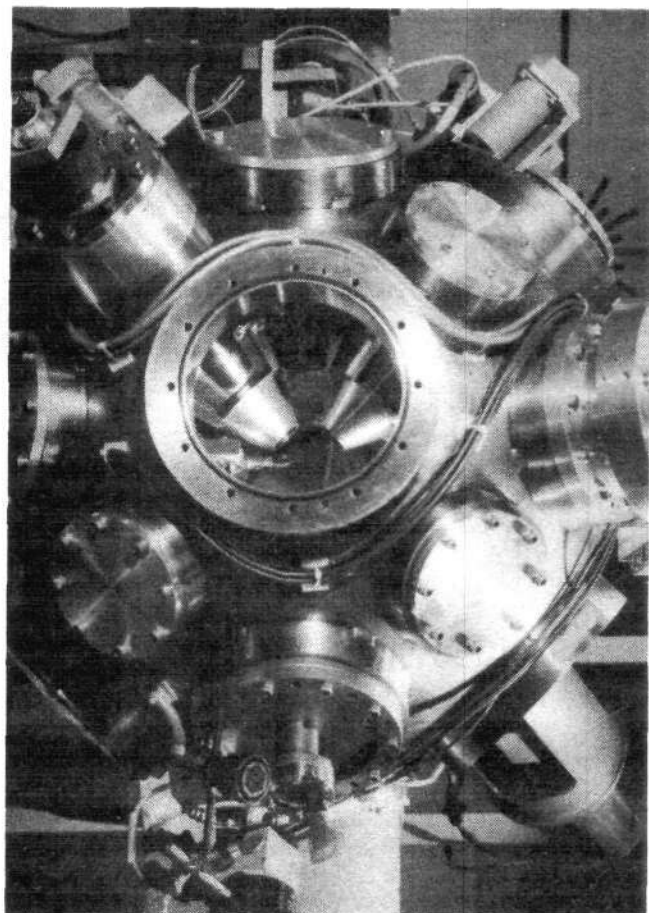
Notes

1. Gordon Harrison, *Mosquitoes, Malaria and Man* (New York: E.P. Dutton, 1978).
2. The Bitman fraud and others are discussed in *Ecological Sanity* by Claus and Bolinger (New York: David McKay, 1977). The evidence of fraud was also summarized by Dr. J. Gordon Edwards in hearings before the House Committee on Agriculture in 1971.
3. See *Ecological Sanity* for details.
4. Dr. Richard Pollak discusses the fraudulent procedures of much of the current research on carcinogens in "There Is No Cancer Epidemic," *Fusion*, Aug. 1978, pp. 40-50.
5. L. Hart and J. Fouts. 1965. "Further studies on the Stimulation of Hepatic Microsomal Drug-Metabolizing Enzymes by DDT and Its Analogues." *Naunyn-Schwiedeberg Arch. Exp. Path.* 249: 486-500.
6. This is reported on p. 4,122 of the EPA hearings transcript.
7. From an address to the American Institute of Chemists, as reported in *Chemical and Engineering News*, May 14, 1973, p. 1.
8. The seven-month hearings conducted by the EPA Hearing Examiner comprised 9,300 pages of transcripts of 125 witnesses who introduced 365 scientific documents as exhibits. When a reporter from the *Santa Ana Register* in California called Ruckelshaus's special assistant Marshall Miller and asked whether Ruckelshaus had read the hearings record, Miller replied: "No, he didn't. He would have sunk out of sight."

In a review of the DDT case written by Max Sobelman of the Montrose Chemical Corporation for the National Academy of Sciences and undertaken at the request of the U.S. Environmental Protection Agency, Sobelman documents how Ruckelshaus responded not to scientific evidence but to the environmentalist propaganda and the fear it had stirred up in the population.

Six-Beam Laser On Line at Rochester Lab

by Charles B. Stevens

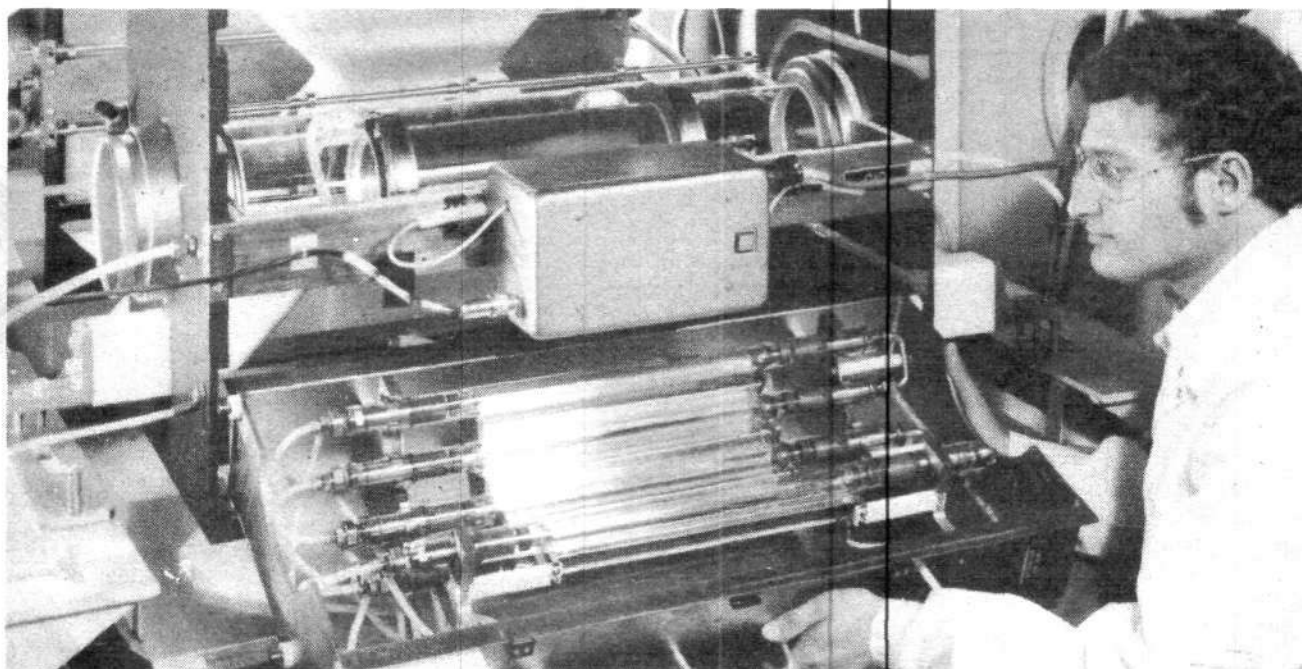


The ZETA target chamber, which has 13 ports for diagnostic equipment and six-beam irradiation.

One of the world's most powerful and advanced laser systems for inertial confinement fusion energy research—the 24-beam, 30-trillion watt OMEGA—will soon be on line at the University of Rochester's Laboratory for Laser Energetics.

The first installment of the full OMEGA system, the six-beam ZETA, was completed in December 1978. In its first series of target shots, it produced 390 million fusion neutrons—only a factor of 10 or so less than the neutron number achieved by Lawrence Livermore Laboratory's SHIVA, the world's most powerful laser.

Although less well-known than the larger national laboratories, Rochester's Laboratory for Laser Energetics is a unique scientific research facility. Not only is it open for use by any scientists who apply to use it, but research at the Rochester laboratory is free from security classification. Such security restrictions have been applied to the Los Alamos and Lawrence Livermore national laboratories



A Rochester technician works with the OMEGA phosphate glass rod amplifiers.

and to KMS Fusion in Michigan (the only private company directly engaged in laser fusion research in the United States).

Reflecting this freedom from security classification, the University of Rochester laser laboratory is not limited to pursuing one particular line of inertial-confinement fusion energy research, or fusion research exclusively. Having the ability to achieve energy densities of 100 million to 1 billion J/cc³ (joules per cubic centimeter) on time scales of one-billionth of a second, giving rise to electric field strengths of more than 10 billion V/cm (volts per centimeter), the OMEGA laser system will be able to carry out crucial scientific experiments in a variety of disciplines. Among these are unique experiments in laboratory simulations of astrophysics, high-temperature diagnostic development, material damage, photon (light)-particle interaction physics, plasma physics, biology, and laser fusion.

The energy densities that OMEGA can reach result in light pressure greater than the pressure of the matter on which the laser is focused. High-efficiency conversion (more than 100,000 J/cc³) into X rays occurs. This X-ray generation has major potential applications to clinical methods of cancer treatment and detection and to experimental biology.

The University of Rochester Laboratory for Laser Energetics is the result of the efforts of a unique consortium of large corporations, electrical utilities, and both the federal and state government. The laboratory got started in the early 1970s under the direction of Dr. Moshe J. Lubin and with major backing from the New York State Atomic Energy Commission and the Exxon Corporation. In addition to Exxon in the private sector, General Electric, Northeast Utilities Inc., and a group of other utilities have helped fund the laser project.

The OMEGA Schedule

In 1977, the Laboratory for Laser Energetics obtained a \$30-million U.S. government grant to build the OMEGA. However, the grant covered only construction costs. Operating expenses, estimated to be \$40 million during construction, were provided by the private sector corporations and utilities mentioned above. The laboratory is

housed in an \$8.5-million building constructed with an interest-free loan from New York State.

The table lists the time frame for bringing the various stages of OMEGA on line. The more than 30-TW (1 terawatt=1 trillion watts) output of OMEGA by Dec. 1980 will make this system equal to the giant SHIVA at Lawrence Livermore and the 20-TW, eight-beam carbon dioxide laser, HELIOS, at the Los Alamos Scientific Laboratory.

Rochester selected phosphate glass for its OMEGA, instead of the silicate glass used in the Livermore SHIVA, because the phosphate glass has better thermal properties. Since the phosphate glass conducts heat more quickly, the phosphate-glass laser rod amplifiers cool down much sooner, permitting a greater firing rate for the laser system.

In terms of the amount that the power of an input laser beam is increased when it passes through a laser amplifier, phosphate glass has a specific gain of 0.26 compared to 0.16 for silicate glass.

Combining this higher potential output per volume of glass with a new amplifier design, the Rochester laboratory has obtained a much more efficient laser system than SHIVA and is able to fire the laser every half-hour as opposed to SHIVA's limit of two to three laser shots per day. This more frequent firing time is crucial, since it will permit a larger number of experiments to be carried out on OMEGA.

The OMEGA facility is conceived of as an international scientific resource, and fusion researchers from Israel have joined the fusion research teams working on OMEGA. Last May, when former Japanese Prime Minister Takeo Fukuda put forward a proposal to provide the United States with \$1 billion for joint fusion research here, the Japanese specifically mentioned their desire to include Rochester in the list of facilities for priority funding.

Subsequently, after Energy Secretary Schlesinger and his assistant, John Deutch, decided unilaterally that no collaboration in laser fusion would be permitted, both Rochester and Exxon approached the Japanese directly for prospective joint work. However, the Department of Energy again intervened and unilaterally forbade any collaboration, despite the fact that all research at Rochester is unclassified.

THE OMEGA SCHEDULE

Laser	No. of Beams	Maximum Energy	Power	Period of Experimentation
ZETA	6	1.2KJ	3-4TW	Dec 1978—Dec 1979
OMEGA	24	4.8KJ	>12TW	Feb 1980—Nov 1980
OMEGA (upgrade)	24	10KJ	30TW	Dec 1980 onwards

The table lists the operating periods of the major laser systems at the Rochester lab.

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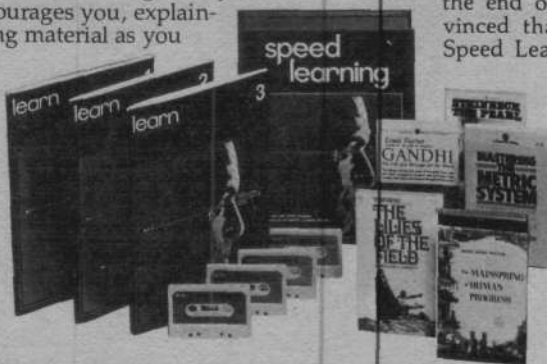
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New Argonne Experiments Disprove Quark Theory

Alan D. Krish's article in the May issue of *Scientific American*, "The Spin of the Proton," deserves more than passing interest because it provides further evidence debunking the quark theory of elementary particles. According to quark theory, it should be possible to construct all elementary particles from a small number of "fundamental" building blocks called quarks.

In a series of experiments, Krish and his coworkers at Argonne National Laboratory in Illinois have produced data that cannot be explained using the quark theory. By scattering polarized high-energy protons from polarized proton targets—polarization is alignment of the protons' magnetic fields, associated with the quantum property called spin—Krish has shown that the influence of the spin or magnetic-moment interaction increases in importance as the energy of the interacting protons increases. The quark model predicts the opposite: that this interaction would decrease in importance as energy increases.

Krish, who describes himself as being in a "small minority" of non-believers in the quark theory, suggested that perhaps the quarkists would now try to invent a new type of quark to account for this breach in their armor.

Proton Model

The particular features of Krish's data lead him to propose a model for the proton. In this model, the proton consists of two distinct regions—a dense core surrounded by a diffuse cloud. According to Krish, it is by penetration to the dense core, where most of the proton spin resides, at high energies that the observed increase in the importance of the spin interaction occurs.

In fact, what may be happening in these experiments is verification of Bernhard Riemann's hypothesis that the nature of matter is such that on the *microscopic* level, the geometry

becomes extremely unsmooth and differentiated. As one penetrates deeper into the so-called elementary particles, one should expect to find significant alterations in their structure that would not be apparent in a more coarse-grained exploration.

One of the major questions to be answered in treating elementary particles as geometrical singularities is: what metric and symmetry properties are necessary to account for observable phenomena such as the mass, charge, and spin of the particle?

A partial answer to these questions may reside in the work of Daniel M. Pisello. Pisello's recent book, *Gravitation, Electromagnetism and Quan-*

tized Charge—The Einstein Insight, develops the notion that the charge of a particle is not a tacked-on predicate devoid of origin but, rather, the result of the ability of space to twist itself up into donutlike kinks.

Beyond the particular questions of which invariants determine the observable characteristics of the elementary particles is a more basic one. What is the precise nature of the negentropic process that has brought the universe to its present state of evolution? And what is the invariant property that governs the production of the invariants we see now.

The groundbreaking work by Riemann on shock-wave propagation discussed in Uwe Parpart's article in the March-April issue of *Fusion* provides a profound insight into how to tackle these problems. And Krish's experiments show why they must be tackled.

—Dr. John Schoonover

Soviet Archeologists Find Evidence of Atlantis

For centuries, Atlantis has been dismissed as merely a poetic fiction of Plato. Now, undersea discoveries by Soviet oceanographers in Europe and the Caribbean confirm the hypothesis that Plato and other classical authors were writing history, not myth.

In press conferences in Lisbon and Moscow early in April, Soviet scientists released pictures taken by the Soviet research vessel *Kurchatov* from the top of the Amper Mountain, part of an underwater archipelago whose peaks rise to within 300 to 600 feet of sea level, and which lies about 200 miles southwest of the Portuguese mainland. Previous press releases reported finds in the Caribbean area.

According to Professor Andrei Aksenov, director of the Soviet Oceanological Institute and leader of the research expedition, "Experts on the deciphering of underwater photographs saw the rather clear forms of a bridge or stone walls and fragments of a stronghold with wide stairways. ... Geologists think that ... this submerged as the result of geological

unrest." Professor Aksenov then stressed that success in his expedition resulted from looking in "precisely the spot Plato indicated."

The investigation of the Atlantis problem became part of the Fusion Energy Foundation research program in conjunction with work on Plato's *Timaeus*, a seminal work in the history of relativistic physics. The presence of the famous Atlantis story in that dialogue puzzled the FEF staff members, until background philological and archaeological research demonstrated the existence of a highly developed prehistoric Atlantic-based civilization. This civilization had some degree of continuity from approximately 10,000 BC to the collapse period of Minoan civilization around the time of the volcanic explosion of Thera (circa 1200 BC), and with ties to the "Peoples of the Sea" and the Phoenicians.

These discoveries firmly wrest the Atlantis story from the hands of the international occult, but not without complaints. The *London Daily Telegraph*, for example, immediately rid-

iculed the Soviet achievement in transforming a mystical fetish into history in the same manner as 19th century mythmakers inveighed against the excavator of Troy, Heinrich Schliemann.

Wrote the *Telegraph*: "Psychiatrists (and even laymen) may well think these people are merely overcom-

Solar and Wind: More Risk, More Money

With the question of nuclear "risk" constantly on the front pages of the daily papers, it is useful to look at Herbert Inhaber's recent study on the risks of energy production, which, for the first time ever, compares the total risk involved in producing energy by conventional and unconventional methods.¹

The main conclusion—a rather shocking surprise to those supporters of solar power and other so-called soft technologies—is that the total risk for these unconventional resources is *two to three times higher than for nuclear power* and about equal to the risk associated with coal- and oil-powered plants (see figure).

As Inhaber demonstrates, soft energy resources cost from 10 to 15 times more than conventional sources, have energy densities several orders of magnitude lower, have net cycle conversion efficiencies six to ten times lower and, in addition, have risks that are equal to and even higher than conventional sources.

Inhaber surveyed the entire energy cycle. He looked not only at the risk to the public from these varied sources of energy production, but also at the occupational risk—that is, risk to the hundreds of thousands of workers who produce the plants and the material that goes into them.

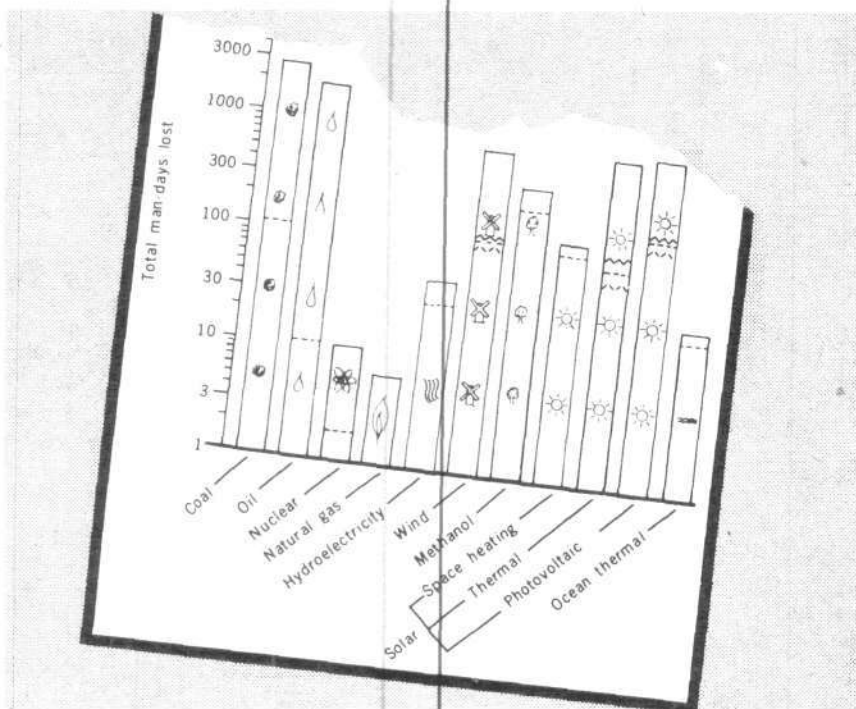
Unconventional sources of energy, such as solar power and wind power, have a lower risk to the public once in operation, but have a much higher occupational risk because of their vastly larger raw material requirements and construction time.

pensating for their unromantic lives and for the total rationality on which the Marxist system rests. I hope the Russians go on to discover further marvels: The Golden Apples of the Hesperides; the Empire of Prester John; the Fabulous City of Manoa; the Land of Youth of the Irish legends; the Phoenix (they must remem-

ber to take a virgin girl zoologist on this expedition); and (for a change) the sources of the Firely River Phlegethon. It would do them all a power of good."

A full report on the Atlantis story will appear in a forthcoming issue of *Fusion*.

—Charles Tate



Source: Herbert Inhaber, "Risk with Energy from Conventional and Nonconventional Sources," *Science*, Feb. 23, 1979.

The figure shows the total man-days lost per megawatt-year output over the life of various energy systems. The top of the bars indicates the upper end of the range of values and the dotted lines within the bars indicate the lower end of the range. The jagged lines within the bars indicate values when low-risk backup—such as nuclear power and natural gas—is used.

The same two factors, materials and construction time, are also some of the main reasons that the total costs for wind and solar are so high.

Remember, since the wind and sun operate only on a part-time basis, solar and wind power techniques require very large energy storage capacities, backed up by conventional power-producing techniques (in this study coal was used). All these factors have to be included in any valid risk assessment—a fact conveniently overlooked in past risk assessments by the "softies."

Inhaber concluded that the unconventional resources would look somewhat better if they were backed up by nuclear power, a fact that the

author admitted "might be philosophically difficult" for the unconventional advocates.

We agree with Inhaber on this point, but let's define this unconventional philosophy for what it is. More specifically: a Malthusian belief structure whose purpose in advocating soft technologies is to destroy technologies that are much cheaper, safer, and more efficient—and with them the U.S. economy.

—Jon Gilbertson

Note

1. Inhaber's study, AECB-1119, was featured in *Science Magazine*, Feb. 23, 1979 under the title "Risk with Energy from Conventional and Nonconventional Sources."

Conferences

Int'l Materials Conf.

The Life and Death Question of World Energy

More than 250 representatives from two-dozen advanced and developing countries discussed what is at stake in world energy policy and how that will affect the price and availability of materials into the next century at the International Materials Conference March 26-29 in Reston, Va.

Under the title "Materials Aspects of World Energy Needs," the conference debated whether, and at what price, raw and semifinished materials will be available to the developing sector over the next decades. As the Third World spokesmen noted, these are questions of life and death for the developing sector.

The most cogent statement of the Third World was laid out by Luiz C. Correa da Silva, the director of special projects of the Foreign Trade Studies Center of Brazil and Brazil's representative to the United Nations Industrial Development Organization (UNIDO). Da Silva stated forcefully that the program laid out at the 1974 UNIDO conference in Lima, Peru—by the year 2000 the developing sector would produce 25 percent of the world's industrial goods—has gone from an ideological commitment to a pragmatic one.

The rise in petroleum prices in 1973 was not the origin of the energy problem, da Silva said, but has been used as a scapegoat for the instability of the international finance system. The solution he posed was to recognize that in addition to the dollar, there are two new important currencies in world finance—energy dollars (petrodollars) and technodollars (Japanese and West German export capability).

There will be a New World Economic Order, de Silva stressed, and it must be based upon "renewables" in order to industrialize the Third World. "The real renewables are research

and the advance in people.... Science and technology will be the major component in coping with the materials emergency and will become a more important component than energy in making materials available" in the future.

In this effort, he said, the most "important import will be technology," and "international cooperation is imperative."

The World Bank Program

A sharp exchange took place between da Silva and Shamsher Singh of the World Bank at the workshop session on "the economics of materials use under conditions of rising energy costs." Singh outlined the billions of dollars required for materials extraction and development in the Third World, after which da Silva emotionally recounted the World Bank's attempted sabotage of the Brazilian steel industry.

In 1965, da Silva said, Brazil was told that in order to qualify for World Bank loans for steel development, a study would have to be done to determine its feasibility and necessity. This study, completed by the U.S. company Booz, Hamilton and paid for by the Brazilian government, delayed for close to five years the government's planned expansion program and, according to da Silva, cost the Brazilian people over \$6 billion in lost revenues from development.

The conceptual and historical backdrop to the antigrowth World Bank policy was presented by the British crown's representative at the conference, Lord Ritchie-Calder. Speaking on the "perspective from a developed nation," Ritchie-Calder stunned his audience by babbling for more than half an hour about how successfully the Nazis had solved their energy and materials problems.

The Nazi coal synthetics program,

which he falsely claimed had fueled the Nazi war machine, showed how "human ingenuity can artifact anything with energy and raw materials." Ritchie-Calder did not include artifacting lamp shades, but did make the case that when you're at war, the costs don't matter.

Based on the linear projection that there will be no scientific breakthroughs in either energy or materials technology, the Lord and a group of his associates did an input-output analysis of the European Community's nuclear development plans in terms of materials requirements. In order to have 2,000 gigawatts of nuclear power in Western Europe, they showed, the energy needed to produce the materials to build the nuclear plants would "precipitate the energy crisis that building the nuclear plants was supposed to alleviate"! Of course, with this kind of reasoning, one would probably not even get up out of bed in the morning.

Enforcing Backwardness

The turn toward appropriate technology for the advanced sector (as well as the developing sector) was outlined by the U.S. and Italian keynote speakers.

Umberto Colombo, current chairman of the Atomic Energy Commission of Italy, reported that he doesn't want to be trapped by the "nuclear fanatics" and will try to get the word "atomic" out of the name of his agency.

Colombo's main call was for "technological pluralism," meaning a hodgepodge mix of "soft" and "hard" technologies that will "preserve local tradition, culture, and ways of life, rediscover the values lost in the quest for material well-being, overcome social and economic divergence, and develop not improved exploitation but conservation and less waste...."

Policy

In short, Columbo's "energy" policy for Italy and the other advanced sector nations echoed the World Bank program of enforced backwardness.

There is a real opportunity for joint work on programs like fusion between East and West, Columbo said, in a statement that was out of step with the rest of his appropriate technology pitch, but cooperation between North and South (the developed and underdeveloped sectors) should be on decentralized, soft technology.

Conservation

S. Victor Radcliff, the head of Resources for the Future and U.S. consultant for the UN conference on Science and Technology for Development, began his presentation by trying to prove theoretically that energy and raw materials are not related. It is too hard to try to convince Third World countries that growth is not possible for them, he said. Much more effective is to posit that "economic growth is politically necessary" but requires more materials for the Third World. Therefore, he said, the only way to stretch the world's diminishing supply of finite resources is for the advanced sector to "conserve" in its use of these materials.

As many conference attendees noted in private, this Alice-in-Wonderland reasoning is the same as that used historically in debating questions of "foreign aid." In reality, if there is not a dramatic return to a healthy rate of real economic growth in the advanced sector, fueled by cheaper and more energy-dense forms of electrical and thermal energy, the developing countries will never develop and the "less-developed" and "Fourth World" nations will die. And, indeed, the death of a good part of the Third World seemed to be one of the unspoken goals of several speakers.

—Marsha Freeman

Proceedings of the Conference on

THE INDUSTRIAL DEVELOPMENT OF SOUTHERN AFRICA

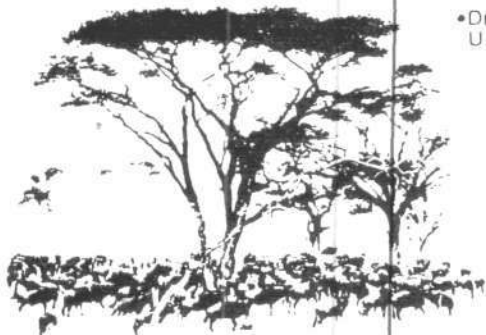
On May 2, 1978, the Fusion Energy Foundation assembled a select group of specialists on industrial development, the Third World, and southern Africa in Washington, D.C. They discussed solutions to the region's explosive racial and political crisis based on the prospects for rapid industrial development of the entire region.

Their approach has now been put forward by leading international forces including the West German government. As the southern Africa crisis deepens, the FEF conference Proceedings are the most important background briefing on Africa policy you will obtain anywhere.

Participants (partial listing):

- David Carr
National Foreign Trade Council*
- Lic. Carlos Romero Bartera
Mexican Ministry of Foreign Relations*
- Dr. William Ellis
U.S. Dept. of Energy*
- Dr. Stan Krause
U.S. Dept. of Agriculture*
- Dr. Hany Makhlof
League of Arab States*
- Uwe Parpart
Fusion Energy Foundation*
- Dr. William van Rensburg
West Texas State University*
- Peter Vanneman
University of Arkansas*

(*Organizations for identification only.)



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Federal Judge Rules That FEF Conf. Was Sabotaged

After three days of testimony April 16-18, Federal District Court Judge William Knox has upheld the Fusion Energy Foundation's claim that its 1977 conference in Pittsburgh on "Energy and Technological Development" was sabotaged by a conspiracy. However, Judge Knox reluctantly said he would have to dismiss the case, *Fusion Energy Foundation et al. v. Clarence Kelley, James Schlesinger et al.*, for lack of specific evidence showing, as he put it, "Who dunnit?"

The FEF charged that at least 10 scheduled panelists and one conference cosponsor withdrew during the few days preceding the April 29, 1977 conference as a result of interventions by the office of Energy Secretary Schlesinger and the Federal Bureau of Investigation.

A startling development in the three-day trial was the revelation by William Martin, an agent for the FBI's Pittsburgh office and the case officer assigned to the FEF, that much of his information on the conference came from "confidential informants" whose identities he insisted he could not disclose for reasons of "national security."

Schlesinger's Austerity Machine

The FEF presented evidence to show that in 1977—as is still the case today—Energy Secretary Schlesinger threw the resources of the U.S. government into promoting the belief that national energy policy must be based on energy austerity and that nuclear energy is unsafe and fusion energy impractical.

Government resources have been deployed not only in public media campaigns, such as Project Pacesetter in Pittsburgh, which set out to show how industry and labor could make conservation an energy resource. But as the FEF case indicates, the govern-

ment is also running multimillion-dollar counterintelligence operations to undercut any organization that dares to propose an alternative, advanced-technology energy program—starting with the FEF's proposals for the crash development of fusion.

Working with the Three Rivers Coalition for Science and Industry—a group representing local political figures, trade unions, and community groups—and the Pennsylvania Rural Electric Association, the FEF organized the conference in Pittsburgh in 1977 to debate these issues. The official government response came in the form of slanders circulated by the FBI that the FEF was a "front" for the "violence-oriented" National Caucus of Labor Committees, and a distorted characterization of the FEF as "extremist" from the Department of Energy.

Gov't Fumbles Its Case

In the court proceedings FBI agent Martin testified that he "first" learned of the conference on no less than five separate occasions and from various sources, including at least two confidential informants. FEF lawyers were quick to point out to the court that a person can hear of something for the "first" time only once, casting serious doubt on the credibility of Martin's testimony.

In one of Martin's many stories, he claimed that he "first" learned of the conference in early April through "private citizen" Jane Kreimer who, in Martin's words, "knew more about the FEF" than he himself did as the FBI case officer. Martin continued that Kreimer informed him that she had "talked to a lot of people" about the FEF.

Earlier FEF investigations had revealed that Kreimer played a central role in terrorizing people away from the conference by spreading lies

about the FEF—lies she said she heard from agent Martin!

In subsequent testimony, Martin said that he "first" heard about the conference through other FBI "channels," claiming the "channel" was a confidential informant. When pressed to reveal his source's identity, Martin invoked "national security" privileges.

(According to the *Glossary of Intelligence Terms and Definitions*, published June 15, 1978 by the Intelligence Community Staff for the Director of Central Intelligence, the guidelines that also govern the FBI, a "confidential informant" is "a person, device, or activity from which information is obtained and for which there is a requirement for protection from disclosure.")

Martin told the courtroom several times that he had his own "opinion" and "interpretation" of clear-cut FBI policies and guidelines, hoping that the court would be led to believe that his source was only one individual and did not involve a conspiracy of methods and sources, such as wire-taps or a group of individuals acting in concert to disrupt the conference and the FEF.

In yet another tale, Martin told the court he "first" learned of the conference—and the fact that panelists were beginning to drop away—through another confidential informant whose information appeared in largely expurgated form in an FBI memorandum dated April 5, 1977. The memo showed that conference panelists and attendees had been targeted from the time the conference was planned.

To quote the FBI memorandum, parts of which were released under the Freedom of Information Act: "It is estimated that a number of key

industrialists and labor leaders as well as scientists from throughout the U.S. will either make an appearance at this convention or send representatives."

FBI Caught in Lies...

Robert Kay, an investigator for the Fusion Energy Foundation, went unchallenged as he testified how Martin not only knew what was going on, but was an active participant in disrupting the conference in total and conscious violation of the FBI's Levi Guidelines. Kay reported that three days before the FEF conference he had talked to Martin, who thought he was speaking to a potential conference attendee. Agent Martin told him the following:

—That the Fusion Energy Foundation was a creation of the National Caucus of Labor Committees and the U.S. Labor Party;

—That the FEF and the Three Rivers Coalition were the only ones still participating in the conference;

—That the Pennsylvania Rural Electric Association and the Allegheny Electric Cooperative had "pulled out" of the conference; and

—That "the FEF was not adverse to using 'Soviet' money."

When asked whether he had ever been disciplined for his general activity against the FEF, Martin told the court proudly that he had not, suggesting that his actions were all sanctioned from higher ups.

...DOE in Coverup

The next person called to testify was Carol Steele, local public information officer for the Department of Energy. Steele was not allowed to say much on the stand because, unlike Martin, she was not "caught" by the FEF until two years after the conference.

Steele's testimony was self-contradictory and openly contradicted that of her associate at the Pittsburgh office of the DOE, Dr. Bernard Blaustein, one of the panelists who withdrew from the conference. Steele told the court that she worked with Blaustein in preparing his talk. Then she proceeded to say that she had never heard of the Fusion Energy Foundation until three days before the conference, when she and Blaustein allegedly received a conference

brochure. Blaustein's decision to withdraw was made at that time, she continued, because the topic on which he was to speak had been altered.

Blaustein, who was not called to testify, had responded to earlier interrogatories from the FEF that he withdrew from the program two months before the conference. But FEF Executive Director Dr. Morris Levitt testified that this was impossible, because brochures listing speakers were mailed only a few weeks before the conference.

Even more interesting and damaging were the statements made by Steele to investigator Robert Kay April 13, 1979—statements that directly implicated Secretary of Energy Schlesinger's office. (The only statements allowed on the court record, however, were those relating to Dr. Blaustein.) Here's what Steele said April 13:

"The Fusion Energy Foundation is very extremist.... Fred Forscher ... is the guy that called our guy Bernie Blaustein.... Fred I think was the one who said Scott Brody is a member of the U.S. Labor Party.... We heard it by hearsay....

"When this conference thing came up ... and [we] saw how extreme it was ... we had to go to Fossil Energy and go up on the ladder to find out how we should react ... and so it was

echoing around the halls in headquarters for a while."

Needless to say, the government's attorney refused to put Blaustein on the stand.

FEF attorney Robert B. Henn summarized his case by linking the vendetta against the Fusion Energy Foundation and its stated policy commitment to pursue brute force development of fusion energy and other high-technology forms of energy to Energy Secretary Schlesinger's national energy austerity program.

Judge Knox interrupted attorney Henn with apparent consternation, and questioned him closely on why the U.S. government would be hostile to the FEF's proposals since, surely, it too funds fusion. Knox then declared from the bench that fusion and fission power are "the brightest hope of the future."

At this, the government's attorney dashed to the bench, waving a piece of paper that stated that the U.S. government was not adverse to fusion and had in fact spent \$400 million in this area the preceding year.

Experts in the field—many of whom are now unemployed because of government cutbacks—report that this is the same level of funding as when Schlesinger took office two years ago and is nowhere near the amount required.

—Rene Reniotis

Announce Breakthrough In Economic Modeling

In a joint press release April 25 with the *Executive Intelligence Review*, the Fusion Energy Foundation announced a major breakthrough in economic computer modeling that will signal the transformation of economics into an exact science.

The announcement was made in connection with the completion of the first phase of the computerized "LaRouche Model" of economic analysis and prediction. In the first phase, a series of trials designed to test the predictive power of the model were successfully run through

the computer. The scientists involved announced that the predictive power of the model is "virtually 100 percent," and its degree of accuracy depends almost exclusively on the accuracy of the input of statistical data.

Speaking for the FEF, research director Uwe Parpart said, "For the first time in history, economic science has succeeded in presenting a prediction and analysis model which, if provided with accurate data, can pinpoint with mathematical precision the effects of any given government or corporate economic policy decision on the level

of international economy and national economy and in the major industrial sectors."

The LaRouche Method

The "LaRouche Model" of economic prediction and analysis was developed on instructions from Lyndon H. LaRouche, Jr., chairman and founder of the U.S. Labor Party and its 1980 presidential candidate. The research and development for the model was conducted by a team of physicists, mathematicians, and economists headed by Parpart.

The computerized LaRouche Model is based on a fundamental theoretical breakthrough in economic science that LaRouche accomplished during the early 1950s. At the time, LaRouche first applied his knowledge of the German mathematical physicist Bernhard Riemann's concept of manifolds (as understood through Georg Cantor's notion of transfinite number) in his Hamiltonian critique of Karl Marx's economic model of extended simple reproduction found in the second volume of *Capital*.

In the first major test of its capabilities, the LaRouche Model was given statistical data from the 1968 to 1973 period and was then asked to predict what would occur if a 400 percent increase in oil prices were superimposed. In response, the computer model was able to produce charts and diagrams describing the behavior of such key categories as rates of capital formation, rates of productivity increases, rate patterns in consumer goods industries, and so forth, which were virtually identical with what, in fact, occurred during the 1974-1978 period in the U.S. economy.

The central distinction of the computerized LaRouche Model from all other types of econometric modeling is the specific way in which it reverses the ordering among so-called independent and dependent variables. In the LaRouche Model, categories usually taken as "given" or "independent," such as raw materials prices, labor costs, and resource availabilities, are treated as "dependent" or determinate variables. The overall rate of change of social-reproductive rates of labor power is taken as the "primary," "determining" variable which, when

interfaced with the growth rates of an economy's energy density and rates of capital formation, gives the economic analyst and policymaker the most powerful economic prediction tool ever devised.

The LaRouche Model is now being programmed to provide evaluations of the effects on the national economy of such proposed policies as deregulation of the transportation industry, energy conservation, and the Kennedy health bill. The results of the computer evaluations will then be supplied to the appropriate labor and

management institutions, as well as to the relevant congressional committees and government agencies.

The FEF and the *Executive Intelligence Review* are holding a public seminar May 3 to explain the system to the business community in New York City, and *Fusion* will feature a description of the model in the July issue.

Parpart also announced that detailed descriptions of the features and capabilities of the LaRouche Model will be presented to a number of U.S. organizations and institutions.

Press Conference Scores Schlesinger Classification Hoax

In a New York City press conference April 11, *Fusion's* associate editor Dr. Steven Bardwell charged that "scientific classification policy in this country is not a policy to defend national security. Instead," Bardwell said, "Energy Secretary James Schlesinger's classification policy has sabotaged national security by keeping this country's scientific community from providing world leadership in the development of new, high-technology energy sources."

The Fusion Energy Foundation press conference was called to announce publication of the March-April issue of *Fusion* magazine, which features a study of Bernhard Riemann's shock wave theory. Although the Riemann paper was written in 1859, Bardwell said, related scientific research is currently classified in the United States, but not in the Soviet Union.

"Scientific classification is used by the Carter administration as a political weapon to defend Schlesinger's Malthusian zero-growth energy policy," Bardwell said. "Fusion, a potentially unlimited source of energy, is a continual embarrassment to the Schlesinger faction's goal of ramming the idea of 'limited resources' down the throat of the nation and creating a war around a phony oil crisis. Thus,



Dr. Steven Bardwell

classification is used to stop development of high technology energy sources."

The Progressive Plot

"Publishing this issue of *Fusion* magazine directly challenges Schlesinger's classification policy by daring the secretary of energy to stop its circulation," Bardwell said. "If Schlesinger doesn't, he will have to admit that the U.S. government suit to enjoin publication of a *Progressive* magazine article on the H-bomb is merely a tool to get the Supreme Court to make a ruling that would make it 'legal' to classify basic scientific research, even in journals, thus totally stifling American scientific creativity."

"Blowing the cover on the Schlesinger-coordinated *Progressive* hoax is easy," Bardwell continued. "The editors of the *Progressive* magazine have, in the past, defended Schlesinger's policy of classification against basic scientific research. They hope to publish engineering material on how to develop the hydrogen-bomb, mate-

rial which *should* be classified. Thus, they provide the Supreme Court with a solid case of upholding censorship, which will then be a precedent for broadening classification into real scientific discussion."

Fusion magazine, Bardwell stressed, in fact, is defending the national security by publishing Riemann's classified research. If this is not developed and encouraged, it would put the United States behind the Soviet and European programs in the development of fusion, especially laser fusion, and in related critical areas of military defense as well. Furthermore, the publication of the March-April Fusion brings the fight for the freedom of scientific inquiry directly out into the open in the United States. Such freedom of scientific inquiry, Bardwell insisted, is essential to any nation's security.

Startling proof of the lack of independent U.S. scientific inquiry can be seen, Bardwell explained to a disbelieving reporter from Associated Press, in a very peculiar policy at the Department of Energy, a place where for the sake of national development, scientific inquiry should flourish.

"The DOE has a close relationship to an official British-American organization called the Joint Atomic Energy Information Exchange Group. The DOE has to first consult its British counterpart to get *mutual agreement* on what can be declassified! This means, in fact, that there is no independent U.S. science policy in its own Department of Energy."

When Soviet scientist Leonid Rudakov came to the United States in 1976 to expand international cooperation around the development of fusion, Bardwell reminded the audience, the Joint Atomic Energy Information Exchange Group created the now famous "Rudakov affair." The joint group classified Rudakov's ideas in the United States, while his ideas were being discussed openly by the scientific community in both Europe and the Soviet Union.

In addition to Associated Press, reporters were present from ABC radio, *The New York Daily News*, and *Science Digest*.

—Mary Gilbertson

Slaner Foundation Forms New Antinuclear Group

Information received by the Fusion Energy Foundation indicates that the Slaner Foundation has formed a "Society for the Advancement of Fusion Energy," SAFE, and is now soliciting support from personnel of major U.S. laboratories, and private industry.

In a press release issued May 1, the FEF warns individuals and institutions who may be contacted by SAFE that, as the acronym already indicates, the organization's purpose should be regarded as nothing but a well-funded attempt to promote environmentalist, antinuclear policies under the guise of support for fusion energy.

SAFE lists as its board of directors: Mr. and Mrs. Alfred Slaner, George Miley of the University of Illinois, George Brumlik (no known affiliation), and Lawrence Philips, who is associated with a textile firm.

The most telling behind-the-scenes connection is the Slaners' association with Kayser-Roth Industries, whose directors play a leading role in the secretive Nuclear Club of Wall Street. Through several of its members, this club has distinguished itself by activities documented to be interfaced with activities of the Mossad, the Israeli intelligence group, and suspected to have led to the passing of A-bomb and H-bomb secrets to Israel.

SAFE board members Brumlik and Miley were both featured in a recent special issue of the *National Review* magazine on nuclear energy. The very next issue of that magazine contained a lead story that slandered the Fusion Energy Foundation.

The FEF statement noted that "SAFE could be expected to attempt recruitment to its purpose by spreading the same kind of lies and insinuations contained in the *National Review* article, against which the FEF is preparing major legal actions.

Letters

Continued from p. 6

about nuclear energy so that I might better counteract the arguments against it. Your magazine, however, if it contains any truth, is so filled with unsavory language that it is repulsive to a thoughtful person. To call people "kooks" and of the "lunatic fringe" shows your own stupidity and does the cause of nuclear power more harm than good. Cease and desist!

R. F. Nunnemacher
Professor of Zoology

Clark University, Worcester, Mass.

The Editor Replies

Scientists who believe in ghosts are not scientists; they're "kooks." Activists who advocate policies that will kill off three-quarters of the world's population do not represent the majority opinion; they are a "lunatic fringe."

FEUDALIST UTOPIA

To the Editor:

Your mention of the New Dark Ages faction led by H. G. Wells and Bertrand Russell inspired the following song, which should be sung to the tune of "Yankee Doodle."

Old Ralph Nader came to town,
On a grant from the Ford
Foundation.
With windmills and solar cells
To undermine the nation.

Chorus:
Feudalist utopia
Powered by human muscle
Brought to you by H. G. Wells
and evil Bertrand Russell.

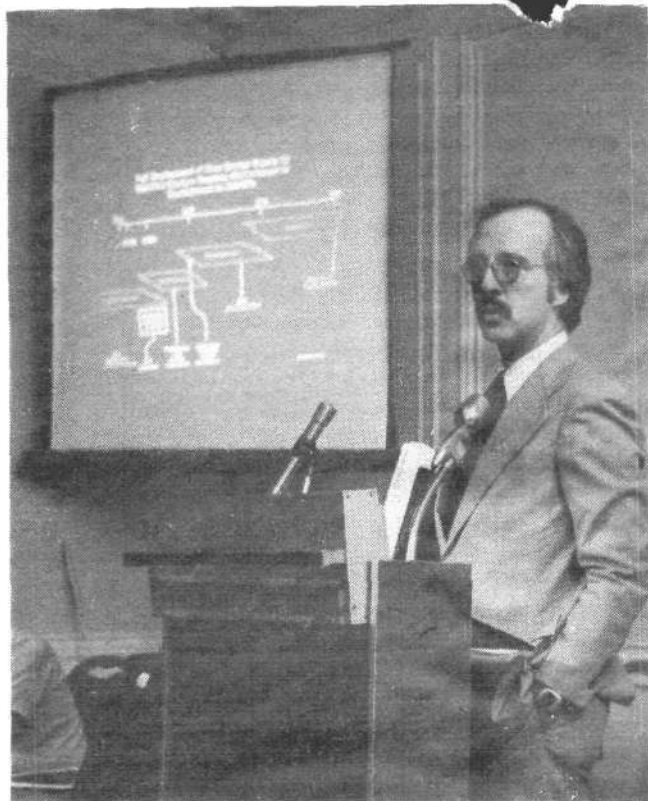
Stop the growth of industry.
Cut the workers' wages.
Spread around the poverty.
Bring back the New Dark Ages.

J. D.
Los Angeles

Dr. Walter Seifritz, whose interview appeared in the May issue of *Fusion*, should have been identified as head of the physics department at the Swiss Federal Institute for Reactor Research. He also teaches at the Technische Universität in Hannover, West Germany and in the United States.

"You are one of the few organized groups I know of that has the courage to stand up and advocate high technology as a solution for some of the problems of the world, and for that I think we owe you a debt of gratitude."

Dr. John Clarke,
Deputy Director, Office of Fusion, DOE,
at the FEF annual public meeting,
Sept. 23, 1978



The Fusion Energy Foundation put the Princeton Large Torus results onto the front pages of the world press.

Your membership in the Fusion Energy Foundation now can ensure that the news of progress in fusion research continues to reach the front pages of the international press. And that there will be commercial fusion power plants within this century.

Membership in the FEF will also bring you 10 issues of **FUSION** magazine and 4 issues of the **International Journal of Fusion Energy**.

Contributions to the FEF are tax deductible.

- One year (10 issues) of **FUSION** — \$18
- Two years (20 issues) of **FUSION** — \$34
- One year of the International Journal of Fusion Energy — \$35 (4 issues)
- Membership in the Fusion Energy Foundation — \$60 (includes one year subscriptions to **FUSION** and IJFE)

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The Consequences of Nuclear Nonproliferation

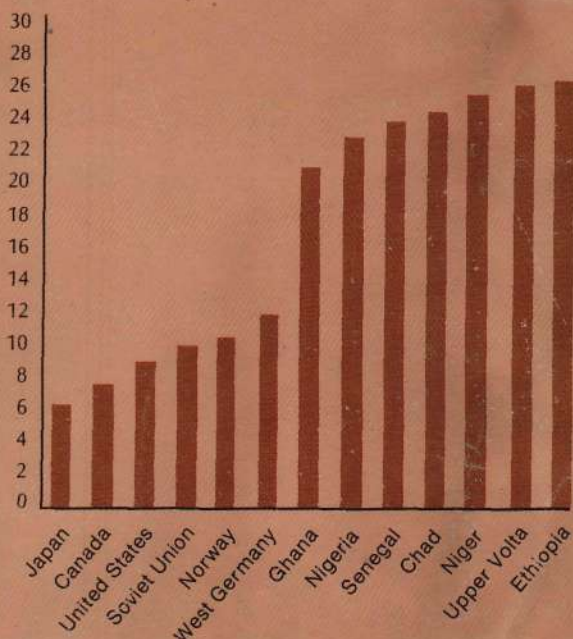
The consequences of nuclear nonproliferation—the battlecry of the Western environmentalists—are war, starvation, and the massive destruction of human potential.

For Africa, as for the rest of the world, nuclear power is the only efficient way to provide enough energy to bring the entire population comfortably into the 21st century. With the proper capital investment and a continent-wide program for education and high-technology industrial and agricultural development, these Ethiopian children—and millions of others—will become the scientists, technicians, and skilled workers of the future. Without nuclear energy, none of us has a real future.

The Fusion Energy Foundation is sponsoring a landmark international conference on "The Industrialization of Africa" in Paris, June 27-29. At the conference, the FEF will unveil a "Blueprint for the Industrialization of Africa," the most comprehensive program for the continent's development in the last 500 years. This issue of *Fusion* presents some background documents for the conference and sets the stage for the kind of discussions at all levels that can lead to positive action by the governments and industries involved.

Cover illustration by Mark Watts; cover design by Diane Yue. The photograph of Ethiopian children lined up at a government feeding center is by Jerry Frank, courtesy of the United Nations.

AVERAGE TOTAL DEATHS PER 1,000 POPULATION
FOR SELECTED COUNTRIES
1970-1975



Source: UNESCO; The figures for Africa are estimates and probably very conservative