



'500-Mile Island'

The Philippine
Nuclear Reactor Deal

Not for Sale

Walden Bello
Peter Hayes
Lyuba Zarsky

**PACIFIC
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Ernesto Nazareno

This work is dedicated to the memory of Shirley Martin, a Navajo activist with the American Indian Movement (AIM), recent victim of a senseless auto accident; and Ernesto Nazareno, a Filipino anti-nuclear activist who was jailed and apparently executed by the Marcos martial-law regime.

This issue is the product of the efforts of the Nautilus Collective, Friends of the Filipino People, and the Pacific Studies Center. Authors are Walden Bello, Peter Hayes, and Lyuba Zarsky. Layout is by Lenny Limjoco. Illustrations are by Charlie Aquilinas.

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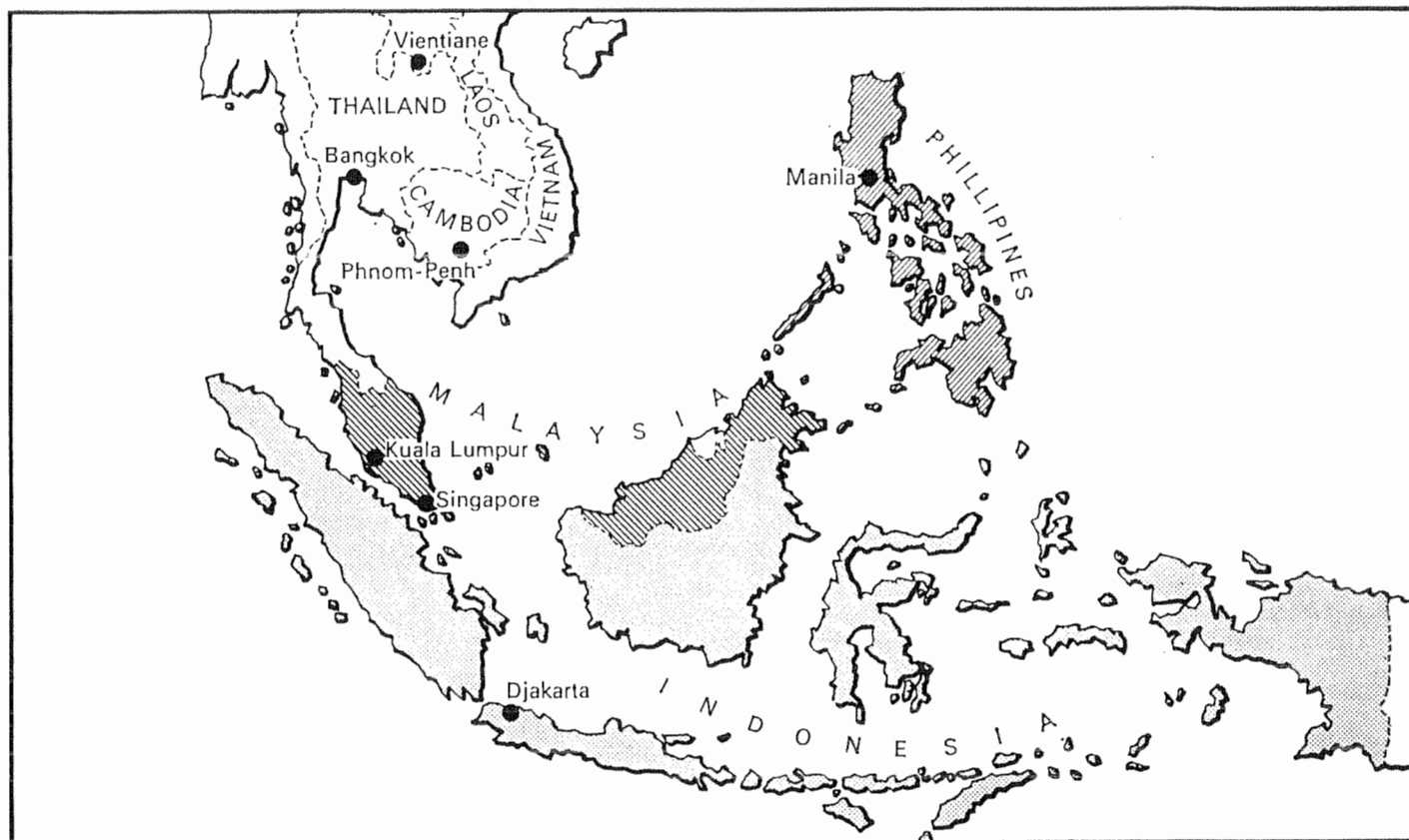
All correspondence should be addressed to Pacific Studies Center, 867 W. Dana, No. 204, Mountain View, CA. 94041, USA. Phone (415) 969-1545.

This is the first quarterly issue of PACIFIC RESEARCH. As this issue demonstrates, we have chosen to publish lengthier studies, less frequently, than our old bi-monthly format. As the late publication date (June) of our first quarter issue shows, we are still behind schedule. We are sorry to be late once again, but we are both underfunded and understaffed. In addition, we have decided to maintain and — we hope you'll agree — improve the quality of *Pacific Research*, rather than meet a rigid publication schedule. We invite your comments.

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Editor: Lenny Siegel

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INTRODUCTION

The political and economic fall-out from the nuclear accident at Three Mile Island, Pennsylvania, has created a political climate in which new U.S. reactor construction will be severely curtailed, at least in the short run. But the American nuclear industry is far from dead. Nuclear expansion continues in other parts of the world, particularly where political opposition is suppressed.

In 1973, the Philippine government decided to build a nuclear reactor on the Bataan Peninsula, near the town of Morong. Bataan, scene of the World War II Bataan Death March and site of a growing Export Processing Zone, is only sixty miles south of Manila on the archipelago's largest island, Luzon. The town of Morong and the reactor itself, are located on the edge of Mt. Natib, an active volcano.

During 1976, the year the State of California enacted what amounted to a moratorium on new reactor approvals, the U.S. Export-Import Bank authorized \$644 million in loans and loan guarantees in support of what is now a \$1.1 billion Philippines project. The U.S. Nuclear Regulatory Commission, at this point divided over many issues of nuclear safety, still has to approve the export of the 600 megawatt Westinghouse reactor.

The Bataan reactor project is rife with problems and controversy: environmental danger, social inequity, corruption, authoritarianism, etc. The first to oppose the project were the peasants of Morong, displaced from their homes and farms or forced to live in the shadow of the reactor complex. Through their opposition — which has faced repression by the Marcos martial law government from the start — they have demonstrated that the resistance to nuclear power extends beyond the advanced industrial countries to include some of

the poorest, semi-literate people in the world.

This report demonstrates that the nuclear industry spans many countries and operates throughout the globe. In particular, to fuel the Philippine and other reactors, the industry will need to mine additional uranium. The most likely sites are Native American territories — in the U.S. and Canada — or Aboriginal Australian lands. On both continents, mining has aroused local and national opposition because uranium mining threatens the health, lands, cultures and even the survival of indigenous peoples. Similarly, the disposal or reprocessing of radioactive wastes threatens the human and natural environment for centuries, wherever it is located. At present the most likely spots for eventual disposal of Philippine spent fuel are on a U.S.-controlled Pacific Island or underneath the Pacific Ocean itself.

Opposition to the reactor, therefore, is also international, linking groups and individuals concerned about environmental destruction, human rights, and social justice in the Philippines, the U.S., Australia, Canada, the Pacific, Japan, and elsewhere.

As this report demonstrates, the problems of the Philippine reactor are not unique. As such, this may be considered a case study. In Brazil, S. Korea, Indonesia — in fact, throughout the Third World — nuclear development serves social orders which are politically authoritarian and economically inequitable. These conditions are not historical accidents, but part of an international system of neocolonialism, dominated by U.S.-based interests. Opposition to nuclear power not only challenges the particular technology but threatens the international order which imposes it.

On Shaky Grounds

In early 1978, the American press gave full front-page coverage to the Westinghouse reactor export to the Philippines. It was an old-fashioned scandal involving power and corruption, but its scale, actors, and object made it especially newsworthy. A U.S. Government agency, the Export-Import Bank, was financing the major costs of a reactor for a government which apparently had been bribed to buy it. The crucial go-between in the negotiations between the Philippine Government and Westinghouse was a Horatio Alger-type Filipino entrepreneur, Herminio Disini, who also happened to be President Ferdinand Marcos' cousin-in-law and very close friend. Reportedly, Disini received a "lubricating fee" of between \$5 million and \$35 million from the firm, which had designated him in 1970 as its Philippine agent. Various components of Disini's conglomerate empire, Herdis Corporation, were also revealed to be the key beneficiaries of the deal: Asia Industries, Inc., was the subcontractor for the project; Power Contractors, Inc., was awarded the contract for civil construction; Technosphere Consultants Group was providing engineering and construction management; and Summa Insurance Company, previously a small-time operation, put together the \$100 million insurance deal for the plant.¹

The corruption surrounding the deal brought public attention to a fact which had long been known by experts and anti-nuclear activists: reactor exports pose grave safety and environmental hazards to people in Third World countries.

REACTOR DESIGN

In this case, experts pointed out the defective design of the light-water reactor. During a trip to the Philippines, Daniel Ford, the executive director of the Union of Con-

cerned Scientists, revealed the results of an independent technical review of the proposed plant undertaken by UCS in 1977. Among other charges, the report warned that the 620 MWe (megawatt-electrical) reactor model was plagued with more than 200 design defects. Additionally, the report asserted that designs for exports did not satisfy regulatory demands which reactor manufacturers must meet domestically.² "U.S. nuclear regulations, design and safety information are on the public record," responded the Philippine National Power Corporation (NPC). "Non-U.S. plants are not being used for 'dangerous untried technology.'"³ Yet no rigorous safety review of the 620 MWe two-loop plant in question has ever been undertaken. In fact, Morris Rosen of the International Atomic Energy Association (IAEA) writes:

Exported reactors are usually referenced to a similarly sized plant under construction in the country of origin; e.g., an exported 600 MWe, 2-loop, pressurized water reactor would be referenced to a supposedly similar 2-loop domestic plant. This referencing procedure has and continues to imply that the reference plant meets the safety requirements of the exporting country and therefore can be licensed.

However, in the United States, as a result of the demand for larger reactors, there is at present no 2-loop plant of the type being exported under construction. Thus, the recent 2-loop reactor plant sold to Egypt, Korea and the Philippines is referenced to a 2-loop plant under construction in Yugoslavia since 1974. This plant, in turn, had been referenced to an earlier 2-loop plant under construction in Brazil, which in turn had been referenced to a domestic plant in Puerto Rico for which an application was submitted to the U.S. regulatory agency in 1970.



Demonstration Against Reactor Export, San Francisco 1978

However, the review of the Puerto Rican plant was terminated in late 1972 because of seismology problems at the site, and it was determined not to continue with the project. . . . Thus, all of the previously mentioned plants have not undergone a rigorous regulatory review, and modifications that might have been required are not available for consideration.⁴

Thus, the "design and safety information . . . on public record" shows that no such information exists!

ESCAPING THE REGULATORY NET

Opponents of nuclear power in the U.S. have successfully utilized regulatory procedures to shrink the domestic nuclear industry. The lengthy plant licensing period, extended even further by citizen intervenors, often exposes a Pandora's box of safety hazards, causing regulatory agencies to require "corrective" design modifications. These costly design changes, added to inflationary delay costs, have greatly increased capital costs for nuclear power and explain, in part, the reluctance of U.S. utilities to further invest in nuclear energy.⁵

The absence of clear, U.S. environmental regulations for reactor exports, coupled with political repression in the Philippines, allowed Westinghouse and the NPC to proceed without such opposition-induced headaches. The U.S. Energy Research and Development Agency (ERDA) stated:

It must be noted that the purchase by a foreign utility of a reactor component from a U.S. manufacturer is a commercial transaction. . . . The Agreements of Cooperation contain a disclaimer clause which states, in effect, that the application or use of any information, equipment, and devices exchanged and transferred shall be the responsibility of the receiving party and the U.S. does not warrant the completeness or suitability of such transferred or exchanged items.⁶

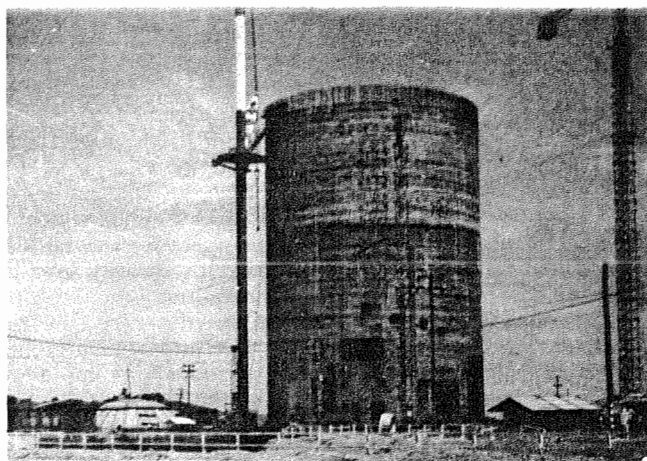
This abdication of U.S. responsibility was matched by the Philippine government, which did not require preparation of an Environmental Impact Statement before plant construction began.

Every U.S. agency involved in the deal disclaimed responsibility for evaluation of environmental aspects of the plant. "Eximbank," said President Moore, "is not in a position to impose such a requirement on sovereign nations."⁷ Besides, Eximbank asserted, safety had already been "adequately studied by the Philippine authorities . . . and the IAEA."⁸

But the IAEA is not primarily a regulatory agency. It was established to promote nuclear power. In fact, in 1966 it initiated nuclear-power personnel training in the Philippines and in 1976 recommended the Westinghouse reactor.⁹

The NPC hired the Ebasco Company of New York to conduct a Preliminary Site Investigation Report (PSIR) to be used by Westinghouse to set design criteria for the plant, after evaluation by the Philippine Atomic Energy Commission (PAEC). Ebasco, however, is usually a sub-contractor for Westinghouse projects. Moreover, PAEC — the Philippine nuclear regulatory body — asked the U.S. Nuclear Regulatory Commission to review the Ebasco PSIR since it did not have "the (requisite) depth of technical expertise nor breadth of experience" to conduct its own review.¹⁰

The NRC did raise some questions regarding the methodology of the Ebasco PSIR, but citing the six person-years of research labor a review would require, it refused to complete the review. It added that its export application reviews do not "evaluate the health and safety characteristics of the facility to be exported."¹¹



To date, then, no rigorous review of the health and safety aspects of the plant has been undertaken. Before the reactor is actually shipped to the Philippines, however, the NRC must issue an export license to Westinghouse. Opponents of the plant have urged the NRC to withhold the license until an Environmental Impact Statement is prepared in accordance with the National Environmental Protection Act of 1969 (NEPA). Until recently, NEPA did not apply to reactor exports. In January, 1979, President Carter decreed by executive order that future reactor exports must adhere to NEPA's guidelines. The status of the Philippine transfer, however, is unclear. Proponents of the plant argue that the transfer has already been transacted and the presidential order cannot apply retroactively. Opponents claim both that the reactor is still in the U.S. and that NEPA rightfully should have applied all along. Both sides continue to pressure the NRC, Congress and Carter, and a decision should be forthcoming in the next few months.^{11a}

Thus, the resolution of critical environmental, health, and safety issues rests on the outcome of a narrow legal battle and other equally narrow considerations. "If a major accident

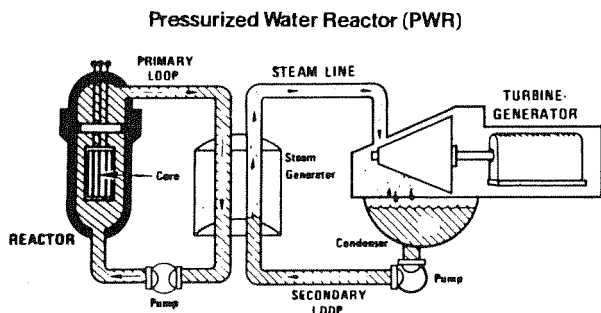
were to occur," states Eximbank President Moore, "obviously all parties concerned would share in the loss of prestige."¹² The Filipino people, who have suffered economic dislocation and political repression because of the reactor, have already lost much more than prestige.

REACTOR RISK

A 620 MWe reactor core contains about 9 billion curies* of radioactive materials after sustained operation. In the Westinghouse design, if cooling water stops flowing over the reactor core and a common-mode failure (knocking out emergency cooling water) simultaneously occur, the core and surrounding machinery will melt into a huge glob of radioactive liquid metal. This would release large amounts of radioactive material — Iodine 131, Strontium 90, Plutonium 239 and other radioactive byproducts of the fission process — into the environment.¹³ The extreme hazard posed by fallout from such a "meltdown" (inhaling one-millionth of a gram of plutonium may cause lung cancer) would necessitate immediate and possibly permanent evacuation of the affected area — potentially hundreds of square kilometers, depending on prevailing winds.¹⁴ Since food chains concentrate

The Westinghouse 2-loop reactor is a machine to obtain heat from the nuclear fission of uranium metal, which in turn generates steam to drive a turbine-generator to produce electricity. In the primary loop, pressurized water carries heat from the core to a steam generator, or boiler, where the heat is transferred through the walls to water flowing through a second loop. Secondary loop feedwater from the condenser is pumped into the steam generator, absorbs heat from the first loop, and turns to steam.

The second loop carries steam at about 1,000 pounds/square inch pressure to the turbine generator and then to the condenser. The two loops are designed to separate (in principle) the radioactive waste in the primary loop from contaminating the turbine, condenser, pumps and piping. The reactor control rods are inserted from above the reactor core.



See: W. Patterson, *Nuclear Power*, Penguin, 1976 and P. Faulkner, *The Silent Bomb: A Guide to the Nuclear Energy Controversy*, Vintage Books, New York, 1977.

radioactive materials, large land areas would become unsuitable for food production. This would be a catastrophe anywhere. On Luzon Island, where the population is already malnourished, it would be especially deadly.

The operation of any nuclear power plant poses a standard set of health and safety hazards: worker exposure to radiation, routine radioactive emissions through cracks and pipes, the production of radioactive wastes for which no adequate disposal solution has been found, etc. The Morong plant has an additional risk-factor: it is situated in an area where, to use the geologists' term, "seismic events" — that is earthquakes — occur often. The Philippines accounts for an estimated 3.2 percent of the world's seismic activity; tremors occur every ten seconds. "Of all the problems that affect the Bataan project," wrote Daniel Ford to President Marcos, "none appears more serious than the danger of earthquake-induced accidents," such as the meltdown described above.¹⁵ As late as March, 1978, Eximbank President Moore maintained, "The reactor is not situated on any known geological fault." However, the NRC review of the Preliminary Site Investigation Report (PSIR) concluded that "faulting would appear to be difficult to detect in the geological terrain within the site vicinity."¹⁶ Furthermore, "considering the paucity of exposures (open exposures of underground geological formations) within 5 km of the site, it is difficult to envision what type of field investigation was conducted." The NRC also indicated that a survey for offshore faults was needed.¹⁷ The great Manila trench, in fact, is only about sixty miles from the Bataan coastline, and a major earthquake fault-line runs through Bataan Province out to the South China Sea 20 kilometers from the site. Confidential sources close to Marcos confirm that U.S. Department of Defense aerial imagery supplied to the NPC has revealed faulting on the site itself — but this report was suppressed. Finally, an IAEA Safety Mission in 1978 recommended "re-evaluation of safe-shutdown" in case of earthquake because it considered it possible that an earthquake, larger than previously anticipated, would occur.

Ostensibly, the Westinghouse plant can be shut down safely even if struck by an earthquake causing a lateral shock of four-tenths (.4g) at the site.¹⁹ Ground acceleration of .4g corresponds with "general panic, conspicuously cracked ground, considerable damage to masonry structures especially built to withstand earthquakes, shifting of frame buildings off their foundations, serious damage to reservoirs, etc."²⁰ In 1968 an earthquake of 7.4 on the Richter scale shook Luzon Island, including Bataan. A recent California quake at San Fernando of 6.6 on the Richter scale (about one-sixth as strong as the Luzon quake) produced a ground acceleration of 1.25g,²¹ exceeding by far the "safety-level" in Bataan.

In addition to the earthquake danger, the Bataan coastline has experienced tidal waves as recently as 1971,²² and the plant site is in the vicinity of five volcanoes.²³ The town of Morong, one geologist recently confided to the Center for Development Policy, is in fact on the slope of Mount Natib, which is classified as a "passive volcano," but where stones testify to a relatively recent eruption.²⁴ According to the same source, Mount Natib shares the same lava bed as Mount Taal, an active volcano about a hundred miles to the south, which erupted within the last decade. Mt. Natib, the same source concluded, is a volcano of the andecite type, similar to the devastating Mount Krakatoa. This is not surprising, since the Philippines is part of the Pacific Fire Belt, a ring of intense volcanic and seismic activity. The NRC review of the PSIR

*The "curie" describes radiation intensity. One curie equals 37 billion (10⁹) atomic disintegrations per second, which is approximately the decay rate of 1 gram of radium.

BUONG KALIGAYAHANG NAGKATITIGAN ANG MAGKASINTAHAN...

TINATANGGAP NA NILA AKO... TAYO SA KANILANG MGA PUSO, MAHAL KO...

SALAMAT SA PLANTANG NUKLEAR!

NGUNIT SA PUSO KO'Y LAGI KITANG PAKAKA-MAHALIN NGAYON AT KAILAN MAN...

HINDI KA MABI-BIGO SA PAGMA-MAHAL NA IYAN, MAHAL KO.

PAGKUWA'Y MAEKAYAKAP NA BINAYBAY NG MAGKASINTAHAN ANG DALAMPASIGAN NA UNTI-UNTING NALILINAWANAGAN NG SIKAT NG ARAW NA SUMISILAY SA KALAKHAN NG PLANTANG NUKLEAR TANDA NG MAGANDANG PAG-ASA AT PANIBAGONG BUKAS NA LIPOS NG PAG-IBIG AT KASAGANAAN PARA SA LAHAT...

Public Information in the Philippines

Man: The people have finally accepted us, my love.
Woman: Thanks to the nuclear plant.

Man: I shall love you forever.
Woman: Ahh, you shall never be disappointed.

Embracing, the lovers watched the brightening horizon, with the sun rising above the dome of the reactor representing the promising future for one and all.

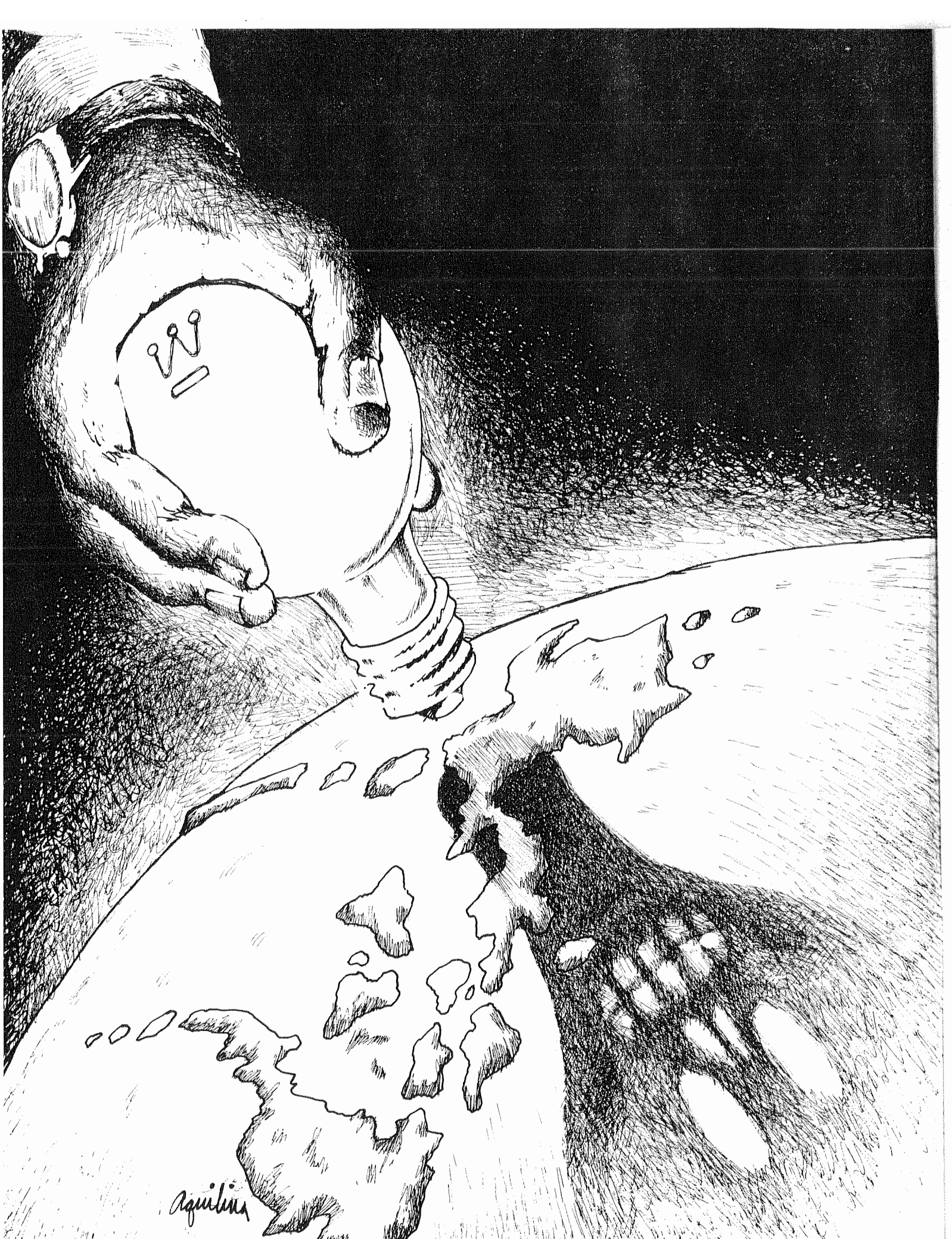
Source: Napacor - Nuklear Komiks, Volume 1, no. 1 (Manila).

concluded that volcanic hazards were not adequately addressed; it warned, "all volcanic hazards should be considered possible at the site," ranging from "ash fall and lava flow to volcanic earthquake."²⁵ Furthermore, the 1978 IAEA Safety Mission concluded that the eruption of Mt. Natih was a credible possibility, requiring additional study.

Construction of the plant is proceeding despite these seri-

ous environmental risks. Opponents believe that the evidence is so weighted on their side that if enough public pressure is brought to bear, the export license might indeed be denied. As one U.S. protestor stated in a message sent to the NRC: "Earthquakes are one thing, gentlemen. We all know that you are experts at pretending they're not there. But active volcanoes? Won't this damage your credibility?"²⁶

1. *Asia Finance*, June 15, 1977, p. 80.
2. Daniel Ford, letter, February 13, 1978.
3. National Power Corporation, "Philippine Nuclear Power Plant," NPC, Manila, 1978. No. 1. p. 17.
4. Morris Rosen, "The Critical Issue of Nuclear Power Plant Safety in Developing Countries," *IAEA Bulletin*, Vol. 19, April 2, 1977. p. 15.
5. Jeff Pector, "The Nuclear Power Industry and the Anti-Nuclear Movement," *Socialist Review*, No. 42. p. 16. A good example of this process is Pacific Gas and Electric's Diablo Canyon nuclear plant in California. PG&E was required to reinforce the plant after an active earthquake fault was found 2½ miles offshore, contributing substantially to its cost overrun of \$800 million, bringing the total cost of the plant up to \$1.4 billion — three times the original projected cost.
6. U.S. ERDA, "Final Environmental Statement. U.S. Nuclear Power Export Activities," ERDA 1542, Vol. 1, April 1976. pp. 14-4, 14-24.
7. Eximbank, "Background Information on Philippine Nuclear Reactor," reply to Rep. Clarence Long, mimeo, March 9, 1978. p. 17.
8. Eximbank, p. 2.
9. S. Jacob Scherr, "U.S.-Philippines Nuclear Cooperation: Revised Chronology," (memorandum), Natural Resources Defense Council, January 31, 1978, p. 2. See also B. Johnson, "Whose Power to Choose, International Institutions and the Control of Nuclear Energy," International Institute for Environment and Development, 10 Percy St., London W1P CDR, 1977.
10. *Ibid.*, p. 6.
11. "The Philippine's Nuclear Power Program," *Justice and Peace Notes*, November-December, 1977, pp. 7, 16.
- 11a. *Nucleonics Week*, April 5, 1979, pp. 8-9.
12. Eximbank, p. 18.
13. U.S. Nuclear Regulatory Commission, "Reactor Safety Study — An Assessment of Accident Risks in U.S. Commercial Power Plants." WASH 1400. Washington, D.C. 1975: Union of Concerned Scientists, "The Nuclear Fuel Cycle," MIT, 1975.
14. J. Holdren, "Radioactive Pollution in the Nuclear Fuel Cycle," *Bulletin of the Atomic Scientists*, October, 1974, p. 19.
15. Ford.
16. Both are quoted in Eximbank's reply to Long, p. 17 (see note 7).
17. *Ibid.*
18. Scherr, p. 7.
19. I. Forbes and M. Goldsmith, "Assessment of Design Reliability/Economics/Safety of Philippine Nuclear Power Plant," Energy Research Group Inc. (U.S.), for Westinghouse International Projects Company, Republic of Philippines, April 15, 1978. p. 7.
20. *Ibid.*
21. P. Faulkner, *The Silent Bomb: A Guide to the Nuclear Energy Controversy*, Vintage Books, New York, 1977.
22. *Justice and Peace Notes*, p. 13.
23. T. O'Toole, "Nuclear Plant Loan Challenged, Marcos Kin Plan Facility Near Philippine Volcanoes," *Washington Post*, February 8, 1978.
24. *Ibid.*
25. T. O'Toole.
26. T. Athanasiou, scroll presented to R.H. Engleken, Region 5 Director, NRC as part of the International Day of Protest against the reactor export, November 30, 1978.



Aquilina

EXIMBANK TO THE RESCUE

The adoption of a "nuclear future" by the Philippines and a number of other Third World countries does not represent the diffusion of a superior technology. Rather, it is a frantic, last-ditch solution to the crisis of overproduction, inherent in capitalist production, which has at last caught up with the nuclear industry. The industry is now threatened with bankruptcy having invested billions of dollars in developing a complex technology to meet a level of demand for electricity which has not materialized.¹

Prodded by a government which sought to ensure a Western lead in developing "peaceful uses" of the atom, electric utilities and equipment manufacturers embarked on a crash program of building and installing nuclear reactors in the 1960's.² Though the utilities responded at first with reluctance, they were soon persuaded by two facts: demand for electricity was growing at eight percent annually,³ and nuclear generation of electricity was calculated on the drawing board to be cheaper than coal or oil generation.

The industry grew too big too fast. Without sufficient empirical evidence major economies of scale were assumed for nuclear energy. In 1964 the capacity of an "adult" reactor was 500 megawatts; by 1967 utilities were ordering 1000 megawatt giants.⁴ Utilities embarked on a spending spree, ordering 104 new reactors between 1970 and 1974.⁵ The boom peaked in 1973, when utilities ordered 41 reactors.⁶

Then came the oil embargo of 1973. This event drastically forced down the rate of growth of demand for electricity from eight to four percent. Not only were existing plants forced to operate below capacity, but utilities found themselves stuck with nuclear reactors under construction to fill a now nonexistent demand.

Plummeting demand was not the only problem that struck the industry. Operating experience forced a drastic upward revision of the cost of nuclear energy, from an optimistic \$180 per kilowatt in 1968 to \$430 in 1973.⁷ The price of uranium fuel, manipulated by a cartel of western countries and firms, skyrocketed at an even higher rate than Arab oil, from \$6.80 a pound in 1968 to over \$60 in 1977.⁸ Finally, the unsolved questions of safety, waste-disposal, and decommissioning caught up with an industry that had earlier minimized their intractability, as the burgeoning anti-nuclear movement began to register successes in delaying the construction or licensing of nuclear plants already ordered.

The utilities cut back sharply on their orders for new reactors, placing only five in 1975, and two in 1978.⁹ "The giant nuclear industry," asserted *Nucleonics Week*, "is slowly, very slowly, bleeding to death."¹⁰ A senior executive of General Electric, one of the "Big Two" reactor producers, warned, "The existing nuclear industry can't survive. Period."¹¹

THE SQUEEZE ON WESTINGHOUSE

Westinghouse, in particular, was severely squeezed by the swift contraction of the domestic market. Formerly specializing mainly in providing the utilities with turbines and

generators, Westinghouse had gambled on the new energy technology in the 1950's and edged out the traditional boiler-and-furnace manufacturers in pioneering the development of the reactor core.¹² Together with its traditional rival, General Electric, Westinghouse thus gained a commanding position in the developing reactor market: between 1955 and 1978, Westinghouse clinched 79 of the 215 reactors ordered in the United States, while General Electric fielded 69.¹³

The collapse of the market thus came as a severe shock to a corporation which generated an estimated 10 per cent of its corporate sales from nuclear equipment.¹⁴ Westinghouse was, moreover, haunted by previous contracts with domestic and foreign utilities it had supplied with reactors: 19 of these utilities have been suing Westinghouse for an estimated \$2 billion for renegeing on agreements to supply them with uranium fuel at a low, preferential price. These contracts had been made when uranium was selling for \$26 a pound.¹⁵

For Westinghouse, the domestic nuclear debacle was merely the crowning point of a series of management failures in a number of strategic fields, including residential construction, steam turbines, and home appliances. Westinghouse's venture into nuclear energy and other fields was apparently not accompanied by that corporate quality which has enabled its rivals, such as GE, to cut their losses in today's fierce oligopolistic competition: strategic planning. "Pervading the whole corporation," asserted *Business Week*, "was the fuzzy philosophy of achieving rapid growth by entering whatever field appeared promising at the moment and gaining volume without regard to risk."¹⁶

NUCLEAR EXPORTS: THE KEY TO CORPORATE SURVIVAL

With so much of its capital tied up in its nuclear work, reactor exports became imperative for Westinghouse for survival. But the dominant position which Westinghouse and General Electric had held in the international market in the late sixties and early seventies had disappeared. In 1966, Westinghouse and GE had a complete monopoly of the non-U.S. market for nuclear reactors.¹⁷ By 1971, foreign competitors had whittled down the U.S. firms' share to about 40 per cent.¹⁸ By 1976, industry and government circles were no longer talking about regaining dominance but about a "holding action": retaining at least 35 per cent of the international market, or a maximum export value of \$5 to \$7.5 billion for U.S. firms.¹⁹ Even these lowered expectations soon appeared optimistic, as Westinghouse and GE failed to field any foreign order between 1976 and mid-1978. Germany's Kraftwerk Union and France's Framatome moved into the lead in the international market.²⁰

Europe, long regarded by Westinghouse as its prime overseas market, was out of the question. Strong anti-nuclear opposition in France, Germany and Sweden stalled the sharp and ambitious turn to nuclear energy which several European governments had taken following the 1973 oil embargo. Anti-nuclear forces, in fact, toppled Sweden's Social

Democratic Government in 1976 and its successor, a center-conservative coalition, in 1978. In Austria, in November 1978, a popular referendum — viewed as a barometer of the future of nuclear energy on the continent — imposed a ban on the operation of the country's first nuclear plant.

Of all the nuclear firms, Westinghouse suffered the greatest setbacks in the troubled European market. Not satisfying stringent safety standards, Westinghouse reactors were rejected in Sweden and Germany.²¹ In Spain, which remains one of the few European states fully committed to nuclear development, GE broke a virtual Westinghouse monopoly in 1975 and 1976, sweeping three out of four of the most recent reactor orders.²² Westinghouse's European "empire," built on fragile licensing agreements with a number of European firms, collapsed as its key corporate links, France's Framatome and Germany's KWU, began to pursue independent construction and sales initiatives.

Indeed, Europe became a shrinking arena for all reactor manufacturers. KWU, for instance, has not had a single order in West Germany since June 1975. The outlook in other advanced capitalist markets turned equally bleak: in Japan, a downturn in the demand for electricity forced utilities to cut back on reactor orders;²³ and in Canada, the domestic nuclear industry failed to persuade the provinces to shift from conventional energy sources.²⁴

To Westinghouse's foreign competitors, therefore, export became equally urgent as a lifeline. "West Germany's construction capacity," warned Theo Somer of *Die Zeit* in 1977, "now amounts to eight nuclear power stations a year. Only two or three of them can be absorbed by the home market; the remainder must be exported."²⁵ This paralleled the warning made by the Canadian nuclear industry to a Royal Planning Commission in Ontario in 1978 that "... unless a successful CANDU export programme can be mounted for at least ten years, some companies will be forced to withdraw from the industry."²⁶ The Commission concluded that "the most likely and, from the manufacturing industry's point of view, the most beneficial, export market for CANDU is in Less Developed Countries."²⁷

THE THIRD WORLD AND THE NUCLEAR TRADE WARS

Since the first sales of commercial reactors to the Third World, which took place in the mid-1960's, the Third World market has been dominated by U.S. firms. However, since the mid-1970's, when hardselling European firms landed spectacular deals with Brazil and Iran, international competition has been stiff.

In June 1975, the Brazilian and West German governments sealed a \$5 billion contract, which provided for the construction of two to eight giant reactors in Brazil by KWU; joint Brazilian-German participation in the development of all phases of the nuclear industry, from uranium prospecting to reactor manufacture; and the building of uranium-enrichment and fuel-reprocessing facilities.²⁸ While the threat that Brazil might acquire nuclear military capability through the enrichment-and-reprocessing provision dominated initial U.S. reaction to the deal, an equally pressing worry was the future of the Third World export business of the U.S. firms.

No less significant was KWU and Framatome's seizure of the inside track in the Shah of Iran's grandiose 20-year program to install 23,000 megawatts of nuclear power by the mid-1990's. In 1976, the French and Germans won \$6.8 billion worth of contracts to build the first four reactors,²⁹ followed in 1977 by another order for four reactors.³⁰

As KWU and Framatome were shutting out U.S. firms in Brazil and Iran, aggressive Canadian marketing of the

CANDU heavy-water reactor netted a major order from Brazil's rival, Argentina, and ended Westinghouse's monopoly over South Korea's nuclear development. CANDU reactors pose a special threat to the light-water reactors marketed by Westinghouse and GE because they run on natural uranium instead of enriched uranium, which must be processed in the United States.

Recently, negative developments in the prime reactor export markets are likely to make the competition for smaller Third World buyers like the Philippines and Korea even keener. The fall of the Shah of Iran has apparently meant the scrapping of that country's nuclear-development plans. And in Brazil, strong resistance to the cost of the Brazilian-German joint nuclear program has emerged within the ruling circle itself, making Brazil less than the unlimited market it seemed four years ago.³¹

THE STATE AND THE NUCLEAR TRADE

The trade in nuclear reactors has been anything but free. Just as the U.S. and European governments pushed the development and marketing of nuclear reactors in the advanced capitalist countries, so have they aggressively supported the efforts of their national firms to carve out markets in the Third

Table 1: Nuclear Reactor Sales to Third World Countries (1966-78)

Country	Reactor	Reactor Supplier
Argentina	Atucha	KWU (German)
	Cordoba	AECL (Canadian)
Brazil	Angra 1	Westinghouse (U.S.)
	Angra 2	KWU
	Angra 3	KWU
Cuba		(Bulgaria)
Egypt	Sidi-Krier-1	Westinghouse
India	Tarapur 1	GE (U.S.)
	Tarapur 2	GE
	RAPP 1	CGE (Canadian)
	RAPP 2	L&T (Indian)
	MAPP 1	L&T
	MAPP 2	L&T
	NAPP 1	WIL (Indian)
	NAPP 2	R&C (Indian)
Iran	Iran 1	KWU
	Iran 2	KWU
	Iran 3	Framatome (French)
	Iran 4	Framatome
Korea	Ko-Ri 1	Westinghouse
	Ko-Ri 2	Westinghouse
	Ko-Ri 3	Westinghouse
	Ko-Ri 4	Westinghouse
	Wolsung 1	AECL
Libya		(USSR)
Mexico	Laguna Verde 1	GE
	Laguna Verde 2	GE
Pakistan	Kanupp	CGE
Philippines	Phil. 1	Westinghouse
Taiwan	Chin-shan 1	GE
	Chin-shan 2	GE
	Kuosheng 1	GE
	Kuosheng 2	GE
	Nuclear No. 5	Westinghouse
	Nuclear No. 6	Westinghouse

Source: Nuclear News, August 21, 1978, pp. 67-85.

World.

The most controversial weapon employed by a number of nations has been the provision of "sweeteners" such as fuel enrichment-and-reprocessing facilities. The dispute centers on the possible use of these facilities to manufacture nuclear weapons. Enrichment units can produce highly enriched, fissile uranium suitable for bombs, while reprocessing facilities allow the extraction of the deadly plutonium substance which is the mainstay of nuclear weaponry.

West Germany used these "sweeteners" effectively in landing the multi-billion dollar reactor deal with Brazil, whose hegemonistic ambitions have been no secret. It was probably also the looseness of the French and the Germans that made Iran, the "gendarme" of the Persian Gulf, opt for their reactors. The U.S. government, however, has reacted strongly to these deals in the name of "non-proliferation." In 1976 it forced the South Koreans to cancel a deal with France that would have provided them with a small reprocessing facility. A French deal to supply Pakistan with similar facilities likewise fell through in August, 1978 when the U.S. threatened to cut off almost all aid to the latter.³²

A more common form of state support for the reactor companies is the deployment of great amounts of state resources to finance nuclear deals. State export-import financing institutions have, in fact, become the promoters, merchants, and bankers of the nuclear industry's colonization of the Third World. And of these institutions, none is larger and more powerful than the U.S. Export-Import Bank.

EXIMBANK AND THE EXPORT OF THE NUCLEAR CRISIS

The Export-Import Bank, or Eximbank, is a self-sustaining export and credit agency of the U.S. government. In 1978, it boasted a lending authority of \$20 billion. Eximbank helps U.S. capital develop external outlets for domestically produced goods to relieve the constant pressure of overproduction. In an average year, Eximbank financing is estimated to assist about 12 per cent of the exports of U.S. firms.³³

Eximbank's promotion of U.S. business has, in practice, meant pushing the products of a handful of giant firms that dominate U.S. industry. "Eximbank's activities," admitted former chairman Stephen DuBrul at the 1976 congressional hearings, "mirror to a considerable extent the nature and composition of America's exporters and exports. 'Large' firms account for a majority of U.S. export value and do, accordingly, receive the bulk of Exim assistance."³⁴ Firms such as Boeing, McDonnell-Douglas, Westinghouse, and General Electric dominate the field of contractors for Eximbank-funded projects, reflecting the bank's recent concentration on the support of such monopolized, capital-intensive, and extremely expensive products as nuclear reactors and jet aircraft.

Overproduction in the nuclear power plant industry is not a case of market saturation, but of public rejection. Eximbank's role, however, is the same: building overseas markets through direct financial subsidies. From 1959 to 1979, Eximbank has supported the sale of about 48 nuclear plants and fuel to 16 countries, with loans and financial guarantees totalling some \$6 billion.³⁵ The level of financial support for reactor exports jumped sharply upwards after 1973. Between 1974 and 1976 alone — the period of rapidly plummeting domestic sales — Eximbank's direct loans and financial guarantees for nuclear reactors totalled \$2.4 billion. This sum was equivalent to that disbursed by the agency since the inception of the reactor-support program 12 years earlier.³⁶ By June 1978, cumulative authorizations for nuclear reactors had far outstripped those for mining and refining equipment and jet aircraft, previously the leading items financed by the

Table 2: Eximbank Authorizations Exposure by Economic Sector as of June 30, 1978 (in thousands of dollars; includes loans, insurance, guarantees)

Sector	Exposure	Percentage
Agriculture	\$ 859,053	3.3
Communication	549,743	2.1
Construction	1,578,052	6.1
Electric Power		
Nuclear	4,971,661	19.1
Other	2,146,934	8.2
Manufacturing	2,202,224	8.5
Mining and Refining	4,521,632	17.4
Transportation		
Aircraft	3,813,894	14.7
Other	2,064,113	7.9
Miscellaneous	3,312,211	12.7
TOTAL	\$26,019,527	100

Source: *Eximbank Record*, Vol. 3, No. 2, August 1978, p. 4.

Bank. These totalled \$4.9 billion and made up 19 per cent of the bank's total exposure.³⁷

The major portion of these loans and guarantees went to Westinghouse reactor projects. Between 1974 and late June 1978, Westinghouse grabbed 11 foreign contracts for reactors financed by Eximbank, while General Electric landed seven.³⁸ These contracts included the two biggest projects ever backed by the Bank: the Philippine Westinghouse reactor, for which the Bank shelled out \$644 million in loans and guarantees; and two Korean Westinghouse reactors, which will receive financing worth \$829.6 million.³⁹ The Eximbank nuclear-reactor program has, indeed, been converted into a multi-billion dollar subsidy for ailing Westinghouse.

THE NUCLEAR TRIANGLE

The intimate relationship between Westinghouse and Eximbank is nowhere more clearly illustrated than in the Philippine reactor deal. For Eximbank, the deal was a landmark in three ways. First, at the time it was sealed in late 1975, the deal involved the biggest financial package ever put together by the Bank: to support a \$1.1 billion project, it offered the Philippine Government \$277.2 million in the form of a direct loan and \$367.2 million in financial guarantees. Second, the Bank, for the first time, went out of its way to guarantee the sale of bonds by a foreign public corporation (the Philippine National Power Corporation) to U.S. institutional investors to raise the portion of the reactor cost which commercial banks were unwilling to cover.⁴⁰ Third, the repayment schedule for the Philippine Government was set to begin in June 1992, six years past the usual grace period of eleven years.⁴¹

The financial negotiations leading to the reactor sale have all the features of a gigantic swindle perpetrated on Filipinos by a conspiracy involving the Bank, Westinghouse, and the Marcos regime. The final Westinghouse price for the reactor came to \$1.1 billion. Just over a year earlier, however, and shortly before the Philippine government had gotten a preliminary financing commitment from Eximbank, General Electric had offered to build two 600 megawatt reactors for \$700 million. Westinghouse soon countered with a price of \$500 million, but unlike General Electric, it did not offer detailed specifications. However, after the Marcos government and Westinghouse signed a letter of intent on June 1974, Westinghouse jacked up the price to \$1.2 billion for two reactors. Finally, in November 1975, Westinghouse of-

ferred a final price of \$1.1 billion for one reactor and \$1.6 billion for two.⁴²

Asked to comment on the price increase of over 200 percent, William O'Casey, chairman of Eximbank at the time the deal was settled, answered that the Bank did not have "the capability to judge the validity of the price Westinghouse was quoting."⁴³ But he dismissed the consequences in a cavalier fashion: "If they (Westinghouse) charge too much, the Philippines has to pay for it. It's their government; they have to protect themselves from being fleeced. We cannot nor would we do it for them."⁴⁴

Damning as it is, Eximbank's plea of ignorance is unlikely. For it could not have failed to notice the big difference in cost of two Westinghouse reactors for which it approved financing on the same day, December 18, 1975: the \$1.1 billion cost of the 620 MW Philippine reactor, contrasted with the \$687 million that Westinghouse was charging Spain for a much larger 930 MW plant.⁴⁵ Similarly, with its supposedly tight oversight on the utilization of loans, it is also unlikely that Eximbank could have failed to notice that Westinghouse's Philippine agent since the early seventies was Herminio Disini, a cousin-in-law and very close friend of Ferdinand Marcos. Disini's conglomerate, Herdis, Inc., won, without bids, the contract for civil construction, and wrote its own huge \$693 million insurance package for the power plant.⁴⁶

Even from the point of view of capitalist financing, it is also difficult to understand why Eximbank approved a massive loan to a country which was already so deeply in debt to international financial and banking institutions. By the end of 1975, the external debt of the Philippines had climbed to almost \$3.8 billion, or 24 percent of its GNP. The \$1.1 billion that was being provided by Eximbank and private banks to build the reactor would therefore amount to almost 30 percent of the country's foreign debt.

Alarm signals had, in fact, been sent to Eximbank and the State Department. No less than Marcos' executive secretary, Alejandro Melchor, warned Ambassador William Sullivan in October 1974:

Preliminary financial analysis made by our financial team have indicated that under the terms of the scheme of the U.S. Eximbank, the National Power Corporation will have substantial cash flow deficits. . . . Furthermore, we also have noted the financial drain this would have on the national treasury's funds which would adversely affect other projects in the public investment program.⁴⁷

Sullivan, in fact, lobbied the State Department to get Eximbank to extend to the Philippines the more generous terms it had extended for a nuclear reactor project in Yugoslavia in 1972.⁴⁸

But Eximbank did not change its terms. Moreover, Westinghouse jacked up its price. Melchor was soon after sacked by Marcos. Key government technocrats, however, continued to oppose the deal, including the influential Board of Investments chairman, Vicente Paterno, who was worried about its financial impact on a number of capital-intensive projects.⁴⁹ This led to a decisive intervention by Marcos, who "wanted the nuclear power project to go ahead quickly and without hitches."⁵⁰

By the end of 1977, thanks partly to the heavy borrowings needed for the nuclear reactor, the external debt had shot up to \$6.5 billion. By then, fearing the recurrence of a debt crisis like that which hit Peru and Zaire, the International Monetary Fund and the World Bank had to impose an informal debt ceiling on the Philippines.⁵¹ Eximbank's representatives at the 1978 congressional hearings on the Philippine reactor were finally forced to concede that the country had "a heavy external debt, rising debt service requirements, and large

trade deficits."⁵² But they were still determined to finance a project that was now clearly a white elephant.

In delivering the project to Westinghouse, Eximbank's shoddy financial assessments were paralleled by biased and sloppy evaluations in other areas, like energy economics, safety, and engineering. Among the more blatant manifestations of this attitude of "benign neglect" were the following:

1. Eximbank ignored the findings of the Philippine Energy Development Board that nuclear power was more expensive than other indigenous power sources like coal, geothermal power, and hydropower. In fact Exim officials were forced to admit at congressional hearing in 1978 that they had not sought comparative costs for other sources of electrical energy.
1. Eximbank pushed the project with the awareness that no rigorous site and safety review by a qualified regulatory agency had ever been done, with the result that the plant is to be built in the vicinity of active volcanoes and earthquake fault.
2. Eximbank was aware that what economic and safety studies were done had been sponsored by the International Atomic Energy Agency (IAEA), an organization whose role is to promote nuclear power, using consulting firms like Burns and Roe, a major nuclear-industry subcontractor. Indeed, Burns and Roe was later hired by Westinghouse to help construct the Philippine reactor.⁵³

In sum, it is difficult to resist the conclusion that the Philippine nuclear power project was an ill-disguised effort by Eximbank to bail out a desperate Westinghouse.

EXIMBANK AND U.S. FOREIGN POLICY

Eximbank's financing of the Philippine reactor can only partially be explained as an effort to push the exports of American big business. For the Bank is also an eminently political institution which promotes the foreign-policy objectives of the U.S. Government.

In its early years, the 1940's, Latin America was the Bank's major field of operations. According to a recent congressional study, its activities in Latin American countries:

were based on three objectives: (1) to influence those nations to support the foreign policy of the United States; (2) to secure strategic sources of raw materials; and (3) to aid in the overall economic development of those nations in order to promote sales of U.S. goods and services.⁵⁴

Eximbank's involvement in developing economies paralleled the general expansion of U.S. foreign aid programs in the 1960's and early 1970's. Although Eximbank officially denies that it is an aid agency, other executive and international finance agencies "regularly count Exim loans as part of an overall foreign policy package to a Third World country."⁵⁵ The grant element in Eximbank loans — that is, the giveaway portion — has been estimated at eight percent.⁵⁶ By the mid-seventies, the Bank had become the largest source of U.S. assistance to 32 Third World countries. Most of this aid has been increasingly concentrated in "energy-resource development" and power plants. This increasing prominence of aid-and-development projects in the Bank's loan-and-guarantee program led one U.S. senator to remark:

In recent years, (Eximbank's) character has changed. It is now a major instrument of U.S. foreign and economic policy. Emphasis is placed on major development projects involving many millions of dollars. The Bank's interna-

tional power and influence have thus been enhanced significantly.⁵⁷

Eximbank performs additional political functions. Its uses are often more pragmatic and more clearly tactical. "Eximbank is a public lending agency that gives State an opportunity to favor, cajole or chastise foreign governments, in accordance with diplomatic objectives," asserts Feinberg.⁵⁸

Desk officers at State frequently seek Exim loans to curry favor with their "clients," as a show of concrete proof of the U.S.'s good intentions . . . Exim loans have often been authorized, or withheld, at the urgings of State, and State's desk officers continue to look upon Exim as one tool in their diplomatic bag of tricks.⁵⁹

The use of Eximbank to further diplomatic objectives is most clearly evident in the case of Eastern Europe. With the onset of the Cold War, Eximbank's export-support activities were designed to bolster Western European economies against the Soviet Union and Communism. A total ban was imposed on loans and guarantees to the Soviet Union and Eastern Europe. When Communist Yugoslavia broke with the Soviet Union in 1948, however, Eximbank provided credits, hoping to win it over to the Western camp. It was only in the early 1970's that Eximbank began to extend loans and guarantees to the Soviet Union and other Soviet-bloc countries, as part of "detente."

In the Philippines reactor deal, the U.S. government not only sought to secure the deal for a U.S. corporation, but also to boost U.S. interests in a country that was "a close friend, ally, and host of two of our most important military bases in the world."⁶⁰ In a confidential telegram sent to Washington after meeting in Manila with a senior Westinghouse official in September, 1974, Ambassador Sullivan asserted:

In discussing project, I stressed that Embassy considered a great deal of American prestige riding on Westinghouse performance, and that therefore we intended to follow project closely. I pointed out that this was in effect Filipino Aswan Dam, being the largest and most expensive project ever undertaken in this country.⁶¹

Several observers have suggested that Eximbank financing of the nuclear deal was a "sweetener," designed to speed resolution of the U.S.-Philippines dispute over the status of U.S. bases.⁶² This would explain then-Secretary of State Kissinger's personal interest in assuring Eximbank's financing.⁶³ In fact, Eximbank may have played a more direct role in base negotiations. On January 3, 1979, just three days after the announcement of the new base agreement, Eximbank granted an unusually large, \$85 million credit to the Marcos government for unspecified multiple projects.

SUPPORTING REPRESSIVE REGIMES

Eximbank backing for the Philippine reactor was part of a pattern of rapidly escalating U.S. support for the Marcos government after it declared martial law in September, 1972. In the four-year period following the imposition of martial law, 1972-76, U.S. bilateral and multilateral aid to the Philippines nearly tripled the aid provided during the four years preceding martial law, rising from \$1.1 billion to \$3.1 billion.⁶⁴

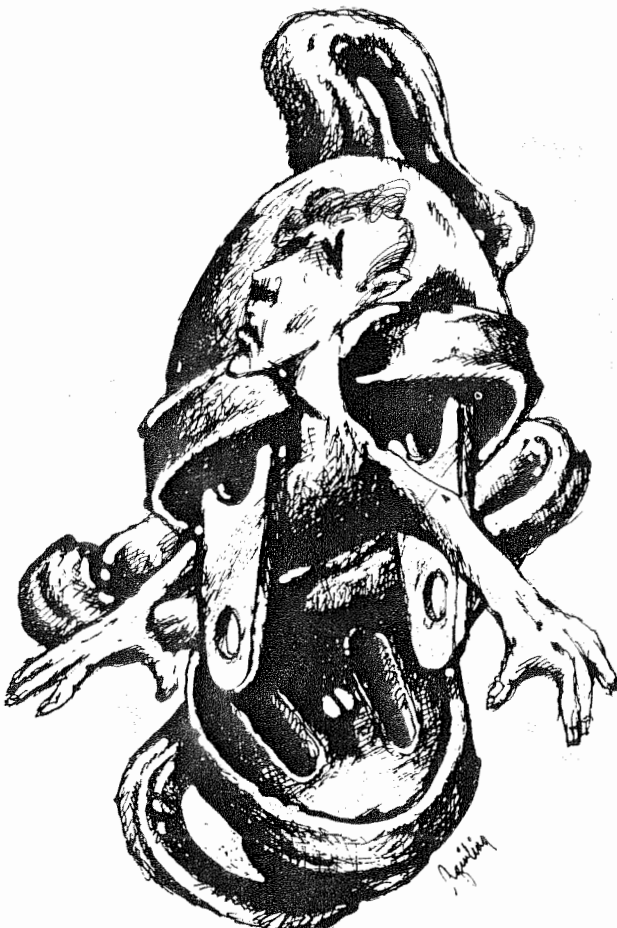
Philippine-related Eximbank authorizations, including the nuclear financing, increased by 335 percent, from \$251.8 million in 1968-72 to \$843.9 million in 1972-76.⁶⁵ The Bank was, in fact, the biggest conduit of aid to the Marcos dictatorship. As of November 30, 1978, Eximbank exposure in the Philippines totalled \$794 million.

In addition to financing the export of civilian equipment, Eximbank has financed a number of arms-related sales to the Philippines, an illegal act under Section 32 of the Foreign Military Sales Act, which prohibits Eximbank from backing arms sales to less developed countries. In 1973, the Bank supported the sale of four C-130 transport planes to the Philippines, after the Marcos regime had unsuccessfully lobbied the Defense Department to include the planes in its military assistance program.⁶⁶ These planes were then used, one report asserted, "for troop transport purposes in the Marcos government's campaign against Muslim insurgent forces in the southern Philippines."⁶⁷ The following year, the Bank approved a \$400,000 loan for the dictatorship, to be used for establishing an "air navigational aids network," which benefits, among others, the expanding Philippine Air Force.

As popular pressure has forced the U.S. Congress to apply restrictions on U.S. military and development aid to repressive regimes, finance institutions like Eximbank and the multilateral World Bank have increasingly become key sources of funding for dictatorships. In 1976, for instance, Eximbank emerged as the biggest single source of aid to Nicaragua, the Philippines, Iran, South Korea, and Taiwan — all countries ruled by regimes which are acknowledged to be gross violators of human rights.⁶⁸

THE BATTLE TO RESTRICT EXIMBANK'S ACTIVITIES

Even though Congress has enacted legislation requiring U.S. delegates to key international finance institutions to vote against aid to repressive governments, "unless it could be shown to directly benefit needy people," Eximbank has managed to successfully fight off most attempts to make it justify its loans and financial guarantees.



Congress did attach advisory human-rights language to Eximbank authorizations for fiscal year 1979, cautioning the Bank to restrict its funding to those projects which directly benefit the needy. The advisory provision, however, seems to have had little effect on Bank policies. In the four months following the adoption of the advisory language, October 27, 1978 through March 31, 1978, the Bank authorized a total of \$210.5 million in loans, guarantees, and medium-term insurance for exports to eleven countries which the State Department itself had classified as gross violators of human rights, including the Philippines, South Korea, South Africa, Argentina, and Nicaragua.⁶⁹

This disregard for human rights considerations led to a bitter showdown during the Congressional authorizations process in 1978. Rep. Tom Harkin (Dem.-Iowa) presented a bill to apply obligatory human rights criteria to Eximbank loans and subsidies. In arguing his case, Harkin asserted:

Several argue that Eximbank is involved with trade, not with aid . . . but the fact is that Eximbank provides aid precisely to encourage trade, and this trade does indeed go to companies which do business in countries that are involved in gross violations of human rights. Trade is not politically, socially or economically neutral.⁷⁰

The bill lost badly, as Eximbank mustered powerful support from business circles and the Carter administration.

In July, 1978 human rights advocates won House passage for the Evans amendment, which prohibits Eximbank transactions with South Africa. A similar effort has, however, bogged down in the Senate.

Eximbank has also fought off numerous attempts to subject its projects to tighter scrutiny for their environmental impact. In July, 1978 the House defeated an effort to require the Bank to submit to Congress analyses of the safety standards in countries buying reactors with Eximbank support. Indeed, in the summer of 1978, the head of the Senate Subcommittee on International Finance, which oversees Eximbank activities, proposed a bill, strongly supported by business interests,

which would explicitly exempt Bank-financed exports, including nuclear reactors, from National Environmental Protection Act (NEPA) regulations.

N.R.C. AS A WATCHDOG FOR EXIMBANK?

The National Environmental Protection Act, according to a recent executive ruling, requires environmental impact statements for Eximbank-financed nuclear reactor exports. On the surface, this seems to be a positive development. However, reactor deals concluded before January, 1979, including the Philippine reactor, are probably excluded. Even when required, such reviews would be carried out by the Nuclear Regulatory Commission, which is reluctant to regulate reactor exports. A recent NRC memorandum typifies this attitude:

There is no clear-cut evidence that developing countries are ignoring H&S (Health and Safety) responsibilities. Further, it would be difficult for the U.S. to move unilaterally to impose stringent H&S standards on these governments. Such an approach would certainly arouse resentment on the part of recipient nations, and would have adverse effects on the U.S. ability to remain a leading supplier, thereby jeopardizing U.S. ability to influence foreign H&S and non-proliferation in general. Therefore, initial steps should focus on voluntary assistance through increasing support for a larger IAEA H&S role based on a consensus of the IAEA Member States.⁷¹

In addition, NRC action would merely *regulate* Eximbank-financed nuclear exports, not end them, and the NRC itself admits that it cannot enforce safety verification of nuclear exports for

verification would be limited to those products manufactured in accordance with NRC standards and regulations . . . an exporter could effectively avoid verification of some of his products by claiming they were manufactured to requirements that differ slightly from NRC requirements.



Marcos Signs Reactor Deal, Manila, February 1976.

In this sense (such a) program would be voluntary — if the exporter and his customer wanted NRC verification, they could obtain it. If not, they could avoid it.⁷²

Furthermore, the NRC has approved reactor construction in California, where almost every reactor planned or built is beside an earthquake fault. At bottom, NRC is staffed by pro-nuclear personnel like Commissioner Joseph Hendrie and Western Regional Director Robert Engleken. In late 1978 Engleken told a delegation protesting the Philippine reactor export:

Personally, I think nuclear development is essential if we are to end our dependence on oil and other fossil fuels. Nuclear energy is, in fact, as safe as other energy sources. It just needs to be appropriately regulated.⁷³

The Philippine reactor sale is not merely a holdover from an earlier administration. Eximbank remains a major conduit for U.S. government support for repressive governments and for the export of harmful technologies like nuclear power. Eximbank president John Moore, while touring the repressive countries comprising the Association of Southeast Asian Nations (ASEAN) in November 1978, claimed: "Eximbank has received no advice that any of the ASEAN countries are in the list of countries considered violating human rights." Moreover, he rated the debt-ridden economies of the Philippines and Indonesia, as well as Thailand, Singapore, and Malaysia as "open and well-managed with growth rates consistently high." Finally, he encouraged his hosts to take advantage of Eximbank financing to import a wide range of American goods, including nuclear power plants.⁷⁴

1. *Business Week*, December 26, 1978, p. 54.
2. Neil Barrett et al., *Atoms for the Poor* (Melbourne, Friends of the Earth, 1978).
3. *Business Week*, December 26, 1978, p. 54.
4. Barrett et al., p. 19.
5. *Business Week*, December 26, 1978, p. 54.
6. *Ibid.*
7. Gloria Duffy and Gordon Adams, *Power Politics: The Nuclear Industry and Nuclear Exports* (New York: Council on Economic Priorities, 1978), p. 28.
8. *Ibid.*, p. 29.
9. *Business Week*, December 26; Center for Development Policy, "Campaign to Stop Runaway Reactors," paper presented at the Airlie Conference, January 9, 1978, p. 2. These new orders were offset by 16 cancellations and 47 postponements in 1975, and 17 and 19 in 1977 respectively.
10. *Nucleonics Week*, November 24, 1977.
11. *Business Week*, December 26.
12. Barrett et al., p. 16.
13. Duffy and Adams, p. 19.
14. *Business Week*, December 26, 1978, p. 54.
15. *Business Week*, January 31, 1977, p. 60.
16. *Ibid.*, p. 61.
17. Duffy and Adams, p. 45.
18. Calculated from *ibid.*, pp. 23, 46.
19. *Oversight Hearings on the Export-Import Bank*, House Subcommittee on International Trade, Investment, and Monetary Policy, May 10-11, 1976, p. 7.
20. Duffy and Adams, p. 45.
21. *Business Week*, January 31, 1977, p. 60.
22. *Ibid.*
23. *Ibid.*
24. *A Race Against Time* (Toronto: Royal Commission on Electric Power Planning, 1978), p. 133.
25. Quoted in Duffy and Adams, p. 47.
26. *Race Against Time*.
27. *Ibid.*
28. Norman Gall, "Atoms for Brazil, Dangers for All," *The Bulletin of the Atomic Scientists*, June, 1976, pp. 5-6.
29. *Business Week*, November 27, 1978, p. 44.
30. *Ibid.*
31. Norman Gall, "Nuclear Setbacks," *Forbes*, November 27, 1978, p. 104. "Iranian Moves Indicate Government Will Halt Nuclear Energy Plans," *Wall Street Journal*, June 3, 1979.
32. Duffy and Adams, p. 66.
33. *Foreign Assistance and Related Agencies Appropriations for 1979*, hearings, House Appropriations Committee, 1978.
34. *Oversight Hearings on the Export-Import Bank*.
35. Calculated from figures in *Foreign Assistance Appropriations for 1979*, p. 77; Duffy and Adams, p. 57; and *Nuclear News*, August 21, 1978.
36. *Foreign Assistance and Related Agencies Appropriations for 1978*, House Appropriations Committee, 1977, pp. 1000-1004.
37. *Eximbank Record*, August, 1978, p. 4.
38. *Foreign Assistance Appropriations for 1978*, pp. 1005-1013; *Nuclear News*, August 21, 1978.
39. *Nuclear News*, August 21, 1978.
40. *Foreign Assistance Appropriations for 1979*, p. 90.
41. *Ibid.*
42. Representative Clarence P. Long, "Background Information on the Philippine Nuclear Reactor," January 4, 1978, p. 4.
43. *New York Times*, February 12, 1978, p. F-9.
44. *Ibid.*
45. *Foreign Assistance Appropriations for 1978*, pp. 1010-1011.
46. *Wall Street Journal*, January 12, 1978.
47. Department of State Airgram, U.S. Embassy (Manila), July 15, 1974.
48. *Ibid.*
49. *Ibid.*
50. *Ibid.*
51. *Philippine Liberation Courier*, December, 1977.
52. *Foreign Assistance Appropriations for 1979*, p. 96.
53. *Ibid.*, p. 75.
54. *Oversight Hearings on the Export-Import Bank*, p. 14.
55. *International Policy Report*, January, 1977, p. 10.
56. Senator Adlai Stevenson, quoted in *Export-Import Bank Amendments of 1974*, hearings, Senate Committee on Banking, Housing, and Urban Affairs, 1974, p. 34.
57. Richard Feinberg, "Division within the State: A Case Study of the Views of Four Federal Agencies in the U.S. Export-Import Bank," *Brookings at Stanford University* (unpublished paper), January 22, pp. 6-7.
58. *Ibid.*
59. *Ibid.*
60. Department of State Airgram, U.S. Embassy (Manila), July 22, 1974.
61. Department of State Airgram, U.S. Embassy (Manila), September 25, 1974.
62. Steve Wake, Congress Education Project, Friends of the Filipino People, personal communication.
63. Department of State Airgram, Secretary of State, August 26, 1974.
64. Walden Bello and Severina Rivera (eds.), *The Logistics of Repression* (Washington, D.C.: Friends of the Filipino People, 1977), pp. 8, 50, 51.
65. *Ibid.*, p. 50.
66. *Ibid.*, p. 57.
67. *Ibid.*
68. *International Policy Report*, January, 1977, p. 10.
69. *Center for International Policy*, testimony of Jim Morrell, reprinted in *Congressional Record*, April 27, 1978, p. 1.
70. *Eximbank Record*, August, 1978, p. 1.
71. James R. Shea, "Health and Safety Conditions in NRC Reactor Export Licensing and Nuclear Assistance Programs," *Nuclear Regulatory Commission*, July 3, 1978, p. 51.
72. *Ibid.*, p. 32.
73. Robert Engleken, statement to delegation from Coalition for a Nuclear Free Philippines, November 30, 1978.
74. *Manila Journal*, November 20-27, 1978, p. 4.

THE POWER OF POWER

The dumping of nuclear reactors in Third World countries is made possible by the existence and growth of an infrastructure of energy generation, distribution, and use patterned after the centralized "hard-energy" systems typical in advanced capitalist countries. Nuclear reactors are regarded, and consequently craved by many Third World development planners, as a key component of programs of "total electrification" they are implementing at the advice and assistance of U.S. aid agencies.

While planners are re-evaluating food assistance and "rural development" programs in response to increasing criticism, electrification assistance continues to be an unquestioned item in U.S. development bureaucracies. Electrification is an unambiguous and neutral index of progress to many American planners and their Third World counterparts.

A major item in the aid package since the early fifties, electrification assistance has been intensified in recent years. Electric power projects, both nuclear and non-nuclear, now constitute the leading sector in Eximbank financing, accounting for \$7.1 billion, or 27.3 percent, of the bank's current exposure.¹ The World Bank has, since 1970, invested an enormous \$5.5 billion in central power stations and transmission facilities in the Third World.² As a portion of the total Bank lending program, power loans climbed from 12 percent in 1973 to 16 percent in 1976.³ USAID's grants and loans for "rural electrification" now make up 40 percent of its principal assistance package, the Food-and-Nutrition Program.⁴ Between 1977 and 1980, electrification assistance totaled \$674 million.⁵

The banks have apparently devised a division of labor in power financing. Eximbank generally invests in nuclear power stations. The World Bank and regional finance institutions such as the Asian Development Bank support the con-

struction of hydroelectric units. And USAID specializes in rural distribution facilities and "electric cooperatives."

TOTAL ELECTRIFICATION

The Philippines is the site of one of the most ambitious programs of centralized electrification in the underdeveloped world, involving all three approaches. The Marcos government has set in motion a grand plan to make electricity available to all barrios by 1984 and achieve "total" electrification by 1990.⁶ This will involve tripling the installed capacity of central power stations from 2788 megawatts at present to 8512 megawatts in 1987. By 2000, the National Power Corporation envisions a total generating capacity of almost 16,000 megawatts.⁷ To carry out this program, the regime plans to invest \$9 billion in the period 1978-1987,⁸ with most of the funds coming from international finance institutions.

The NPC envisions the Eximbank-financed reactor as one component of a system of nuclear power stations with a capacity of 3940 MW by 2000.⁹ The nuclear plants are, in turn, to be integrated into a network of gigantic hydroelectric projects, the construction of which is now being supported principally by the World Bank and the Asian Development Bank. One of the most massive of these hydroelectric schemes is the controversial World Bank-financed Chico River Dam System in Northern Luzon, which, upon completion, is expected to have a generating capacity of 1010 MW.¹⁰ Electricity produced by this complex of nuclear and hydroelectric power stations is to be channeled not only to urban and industrial centers but also to remote agricultural areas.

The distribution of power to provincial towns and villages is to be managed by "electrical cooperatives." Setting up these cooperatives has been USAID's major effort in the

Philippines in recent years, with the agency spending \$80 million between 1972 and 1977 to establish 83 cooperatives in 450 towns.¹¹ AID considers this program one of its "success stories" and the "launching pad of other RE (rural electrification) programs in Asia — mainly in Pakistan, Indonesia, and Bangladesh."¹²

NUCLEAR COSTS

Nuclear power is an expensive means of generating electricity in the Philippines — assuming for the moment that electricity is the energy form most needed. This can be shown by comparing the total costs of generating electricity from oil with that of uranium.

Officials of the Philippine Atomic Energy Commission (PAEC) have claimed that the Westinghouse reactor will save \$60 million annually by replacing crude oil imports. That is, the difference between oil and nuclear fuel costs for a 620 megawatt power station is about \$60 million.¹³ But this is like saying that the only cost of running a car is paying for gasoline.¹⁴ To include capital costs and other operating costs changes the picture radically. The capital costs of a nuclear power reactor are 3.8 times greater than those of an equivalent oil-powered machine.¹⁵ Taking into consideration both capital costs and operating costs (fuel, labor, maintenance, and materials), it is estimated that nuclear-powered electricity would in fact cost about 28 percent more than oil-fired electricity in the Philippines.¹⁶

These estimates have been confirmed by a number of studies. A 1978 report to the U.S. Arms Control and Disarmament Agency asserts, "In the Philippines oil-fueled plants seem the least expensive, followed by natural gas, coal and nuclear power respectively."¹⁷ In 1975, a major review of nuclear power in the Third World conducted for the U.S. Energy Research and Development Administration concluded that 300-600 MWe reactors "are only marginally competitive except under the most optimistic assumptions."¹⁸

Eximbank calculations that nuclear-powered electricity enjoys a 28 percent advantage over oil-fired power must have been based on very optimistic assumptions, especially as to future costs.¹⁹ Commenting on the cash flow estimates for the reactor, a senior Eximbank official in fact admitted that "Actually, you could come up with anything, that's the problem."²⁰

Nuclear power also compares unfavorably with hydroelectric power and geothermal power. According to the Philippine National Economic Development Authority (NEDA), hydroelectricity is "the cheapest and most important source of power in the country."²¹ Even the International Atomic Energy Agency (IAEA), the obviously pro-nuclear power body that did the initial study for the Philippine reactor, admitted that Luzon Island had between 1500 and 5000 MWe of hydroelectric potential.²² It went on to recommend, nonetheless, that precious development capital be invested instead in expensive nuclear technology.²³

Geothermal energy is a resource in which the Philippines is rich. Lying in the "Pacific Fire Belt," an area of intense tectonic and volcanic activity, the country has been estimated recently at 2,200 MWe of geothermal potential.²⁴ Its development, however, has taken a backseat to costly nuclear power. Rand Corporation analyst Guy Pauker notes:

It is an interesting question why, in view of favorable cost ratios and of an extravagantly optimistic assessment of the Philippines' geothermal potential, that source of energy has been programmed to provide only 15.8 percent of the 10,100 MW installed capacity envisaged by the 1977 Energy Program ... by 1987.²⁵

It is, in fact, interesting to note that the State Department instructed USAID in August 1976 to disapprove aid for Philippine geothermal development.²⁶ This came after the Department, through the U.S. embassy, played a vital and enthusiastic middleman's role in securing the reactor deal for Westinghouse.

The economic disadvantages of nuclear power do not, however, merely exist in the realm of estimates and projections. A recent study of electric rates in the United States since 1972 shows that the rate increases set by utilities with significant nuclear-generating facilities were 27.3 percent larger than those set by utilities with little or no dependence on nuclear power.²⁷

The Marcos regime clearly did not choose nuclear power because it was cheaper than using oil or other available alternatives. The decision to install a reactor was made in July, 1973, three months before the OPEC oil price rise of October, 1973. The decision was not based on the economic "rationality" of marginal cost comparisons, but on political and ideological considerations.

ENORMOUS INVESTMENT

Electrification, even if carried out safely and efficiently, does not necessarily mean social and economic progress. It requires vast financial inputs which might be spent better elsewhere. In the Philippines, the share of electrification in fixed capital formation rose from 3.9 percent in 1954 to 12 percent in 1976, and is expected to reach 25 percent by 1982.²⁸ Electrification now represents 4 percent of GNP and accounts for almost 40 percent of investment in public services.²⁹

This actually understates the magnitude of the program. A World Bank analyst notes, electrical generation requires complementary investment, not only in transmission and distribution equipment, but also in end-use appliances and machinery.³⁰ It has been estimated that in the Third World, every dollar invested in electricity generation demands an additional investment of \$8 to \$15 in other sectors.³¹ If the investment is not forthcoming, then the country's electricity-generating capability will be underutilized. If it is, the capital for investment in other, non-electric-intensive services and sectors, such as agriculture, will be correspondingly reduced. In the Philippines, we are speaking of complementary investment of at least \$72-\$135 billion over the next decade.

Furthermore, as Table 1 reveals, primary energy used in electricity accounts for only 16 percent of the total primary energy sustaining Filipino society as presently structured — or only 6 percent if calculated enthalpically.³²

Since the demand for electricity is derived from other productive and consumptive sectors, the huge opportunity costs of providing electricity requires careful consideration of its end-uses. Do the uses of electricity in the Philippines justify such a massive investment of national resources? Or should investment be geared principally to other sectors, as suggested by an increasing number of development specialists, who believe that "the industries that are of utmost urgency in the economic development programme of Asian countries are industries which do not require economic concentration or large consumption of power per unit of production."³³

THE URBAN BIAS

The 1978 economic development plan of the Philippine Government states that the objective of the electrification program is to achieve "equity in energy distribution within

the country, aligned with areas identified as priority for social and economic reasons."³⁴ If equity is the goal of the six year old martial law regime, its record in the distribution of electrical energy hardly reflects it.

About 90 percent of the electricity generated in the Philippines is used in urban-industrial enclaves which contain no more than 30 percent of the population.³⁵ Industry and construction (with the exception of energy-producing industries) head the list of top energy consumers, accounting for 40.5 percent of total consumption. (See Table 2.) In the Greater Manila Area, the biggest industrial user of electricity is the copper-exporting Marinduque Mining and Industrial Corporation, which is partly owned and managed by American and Canadian interests.³⁶ It is followed by paper mills, which provision Marcos' media empire; chemical industries, which include such U.S. giants as Procter and Gamble Philippines and Colgate Palmolive; and steel industries, which are dominated by Japanese and U.S. concerns.

Export-led Industrialization. Another major user of electricity is the Bataan Export Processing Zone in Mariveles, which will be connected to the reactor a few miles away.³⁷ Seventy percent of the products of the predominantly foreign firms operating in the zone are earmarked for export.³⁸ More industrial export zones patterned after the BEPZ are currently being planned by the regime, including sites on Mac-tan Island and at the "excess base lands" being turned over to the Philippines by the U.S. Government.³⁹ Those sectors of Philippine agriculture which consume significant amounts of electricity export most of their products, as well. For example, 61 percent of sugar production, which takes up three percent of all industrial electricity in its milling operations, is exported.⁴⁰

Much of the Philippines' electricity is therefore "em-

bodied" in exports to be used by the global rich in North America, Japan, Europe, and Australia. Of course, the Philippines also imports "embodied electricity." The net gain or loss is unknown. Of far greater importance is the question of whether or not the bulk of these imports — capital goods and raw materials for industry, oil, cars and transport equipment, and industrial consumer goods — go toward serving the needs of the majority of the people.

Furthermore, nuclear power may scare away precisely this external investment which is sought by comprador regimes, by destabilizing their economies. As Stanton Smith wrote:

As Director of Corporate Planning and Development for a major aluminum company (Alumax) I was appalled during my negotiations in the Spring on 1975 with the Iranian Minister of Industry by his proposal to supply electricity to our proposed joint venture aluminum smelter from . . . nuclear stations instead of the previously planned, inexpensive, reliable gas-fired steam electric generating stations. As a result we abandoned all plans to invest in Iran, and other foreign investors in energy-intensive heavy industry have had the same reaction (even if a government offers to "subsidize" their nuclear electricity supply to your project at 7 mills/kWh, as they did, when it cost 30 mills, you can count on the "next" government violating the contract possibly even before your \$300 million smelter is completed).^{40a}

Thus, an effort to legitimate the regime in the short run with a symbol of technological modernity — i.e., the reactor — may backfire in the long run. This can "overdetermine" the fragile class alliance sustaining the regime,^{40b} and in the Philippines it may undermine Marcos. R.J. Barber warned the U.S. government in 1975:

Table 1. Sources and Uses of Primary Energy — 1976/77 (in 10⁶ b.o.e. — barrels of oil equivalent)^a

End-Use Sector	Fossil Fuels (1977)		Hydro-electricity (enthalpic equivalent)	Total Commercial Fuels	Agro-Wastes. ^c	Traditional Fuels (1976)				Total Traditional and Commercial Fuels	
	Solid Fuels	Liquid Fuels				Fire-Wood	Coconut & Pork Oil ^e	Solar Clothes Drying	Solar Crop Drying		Total Traditional Fuels
Agricultural & Commercial ^b		5.6	0.7	6.3		11 ^d	1.2	3.8	4	20	26.3
Transportation		29.1		29.1							29.1
Industry	0.5	23.1	1.0	24.6	9	3 ^f				12	36.6
Electricity	0.2	15.5		15.7							15.7
Totals	0.7	73.3	1.7	75.7	9	14	1.2	3.8	4	32	107.7

a. Not including human or draft animal labor. A crude estimate of manual human labor energy input 80% of the 14.5 million workforce at 8 hours per day and 246 days/year at 0.08 kW/person) yields 1.1 million b.o.e. per year. Fifty-two million carabao (at 1200 hours/year and 0.4 kW/carabao) yields another 1.6 million b.o.e. per year. On this basis, animate energy adds another 2.7 million b.o.e. or 3 percent of total primary energy flow.

Figures in the table are converted from the source material at 1 metric ton of coal equivalent (MTCE) equal to 26 Gigajoules (GJ), 1 barrel of oil (b.o.e.) equals 5.8 GJ, 1 metric ton of primary liquid fuel equals 1.5 MTCE, 1 metric ton of secondary liquid fuel equals 1.6 MTCE. Primary energy for electricity is included under fossil fuels, with the exception of hydroelectricity which is converted at the enthalpic equivalent of 1 kWh equals 3.6 MJ. Figures are only approximate and are more illustrative than definitive.

b. Aggregated (unfortunately) in source material.

c. Bagasse, coconut shells, wood, etc.

d. Domestic cooking in 5 million households.

e. Oil lamps for 2 million people.

f. Tobacco industry.

Source: Asia-Pacific Energy Studies Consortium papers, July 1978 (inimeo), Resource Systems Institute, 1777 East-West Rd., Honolulu, Hawaii 96848, U.S.A.

If the plants perform like Indian Point Number One (zero capacity factor in 1973) . . . the economic and other consequences will be severe and the decision considered most unwise. Indeed a government could fall over just such an issue.^{40c}

Urban Inequality. Not all Filipinos have the same access to goods and services made with electricity. Government figures show that the top ten percent of Filipino households (earning more than \$1333 annually) receive 38 percent of total household income; the bottom ten percent (earning less than \$133 annually) receive one percent. The lowest 40 percent (earning below \$400 annually) account for only 16 percent of total family income.⁴¹

Furthermore, poorer households tend to spend a far greater proportion of their income on food than richer households. The goods most relevant to the needs of most Filipinos, in other words, come from agriculture, which is one of the least electric-intensive of all productive sectors, accounting for only 2.4 percent of national electric consumption. (See Table 2.)

Urban Residential. In the urban areas, the poorer 40 percent of the population did not use electricity at all in their homes in 1975.⁴² A significant number of them — estimated at over 25 percent of the population of Manila and other urban centers — reside in dense shantytown concentrations which have minimal links with electricity transmission lines.

Studies elsewhere have shown that it is the urban rich who consume the major portion of the electricity destined for residential use, because they own and use a far greater number of appliances than the poor.⁴³ The use of these appliances by the wealthy boosts the peak demand for electricity, decreasing the load factor and stretching the generating capacity of Third World electrical systems to the point of collapse.⁴⁴

Less Than a Trickle. The Marcos regime's strategy of centralized electrification for urban, export-oriented industrialization might be defended on the grounds that its material benefits ultimately "trickle down" to the poor majority of the city. Statistics on the living standards of urban workers reveal, however, that their real income actually declined by about 37 percent between 1970 and 1976.⁴⁵ This decline stemmed from the ban on strikes, tight controls on organizing, and other anti-worker policies of the government, which allowed the rate of exploitation, according to one study, to rise by as much as 110 percent in the first two years of martial law alone, 1973 and 1974.⁴⁶

Since these years were also years of rising electricity rates and rising prices for industrial consumer goods, the poor majority of the city now constitute even less of a market for electricity and industrial consumer goods than they did nine years ago. One report to the U.S. Department of Energy noted in 1978, the regime's industrialization strategy has "failed to make significant contributions to the direct satisfaction of basic human needs of the (population). . ."⁴⁷ The major benefits, it asserts, have accrued to a small urban elite.⁴⁸

THE RHETORIC OF RURAL ELECTRIFICATION

To defuse criticism of its heavy emphasis on urban electrification, the Marcos regime has pointed to the "accomplishments" of its rural electrification program, and publicized its resolve to "electrify the entire countryside as soon as possible."⁴⁹ However, the Philippine rural electrification strategy is not to create dispersed small-scale electric generators, but to connect rural areas to large-scale centralized power plants.

The management of electricity distribution is in the hands of cooperatives. As of January 1978, ninety-six of these cooperatives had been organized in 72 provinces by the National Electrification Administration.⁵⁰

The regime's main backer for rural electrification is the U.S. Agency for International Development:

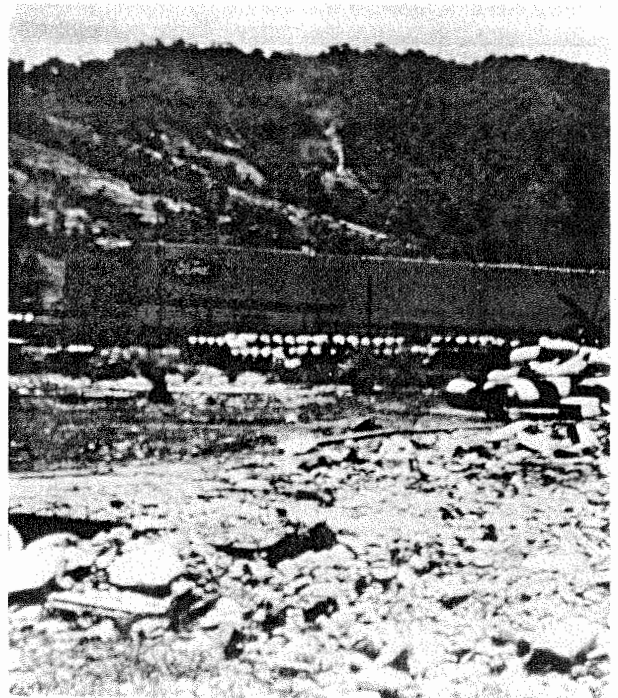
The Rural Electrification Program is a massive undertaking both in terms of the financial resources that are being directed to the rural areas and also in terms of the magnitude of the impact that RE is having in the countryside. The impact ranges from the direct benefits to the rural poor from household connections to increased employment and productivity, better educational facilities and improved medical care as a result of electrification. Additionally, farmer productivity is increased through the use of electric motor-driven water pumps to control and supply additional irrigation water. Employment opportunities also increase from the increase in food production.⁵¹

In addition, the agency claims that rural electrification contributes to a healthier environment and even to "the emancipation of women."⁵²

In reality, how does the USAID-backed rural electrification effort measure up to its stated goals twelve years since it began in 1967? Very little on all counts.

Agricultural Production. The contribution of electrification to agriculture is summed up in the fact that only 2.3 percent of total electricity is consumed by the combined sector of agriculture, dewatering, fishing, and forestry, although this productive area includes 54 percent of the labor force.

As late as 1976, rural electrification had "aided" in the irrigation of only 34,100 hectares of riceland,⁵³ or less than one percent of the country's 1.4 million hectares of irrigated riceland.⁵⁴ Out of more than 10,000 irrigation pumps in the country, only 425 were electric as of 1976.⁵⁵



Ford body-stamping plant in the Bataan Export Processing Zone, one of the beneficiaries of electrification (photo by Bob Snow)

Even in the area covered by the MORESCO "model" cooperative, which was started in 1967, there were only fifteen electric-driven irrigation pumps installed by 1975.⁵⁶ Seven of the nine users of the pumps had a combined irrigated area of only 107.5 hectares in 1975.⁵⁷ This dropped to 99.5 hectares in 1977 as one large user reverted to a gravity feed system.⁵⁸ After twelve years, therefore, MORESCO electricity irrigates a mere fraction of the 46,581 hectares of land under food crops in the region.⁵⁹

USAID grudgingly admitted in 1978 that the electrification effort had not resulted in a "significant increase of the number of electric pump irrigation systems."⁶⁰

The proper response does not seem to lie, however, in an even more massive effort to install more "electrical driven water pumps, rice mills and other labor-saving technology," as USAID proposes.⁶¹ The agency seems to be straitjacketed in the assumption that the introduction of electricity into agriculture would automatically spin off a number of social benefits, including improved agricultural productivity, rising employment, and equity.

In fact, US assistance projects introducing new technology have often caused stagnation of production, growing unemployment, and rising inequality. For instance, a World Bank-supported project which brought tractors to Pakistan in 1968 touched off a disastrous displacement of rural workers without increasing production.⁶² So did high-yielding "miracle rice" seeds in Bangladesh.⁶³ More immediately relevant are the effects of USAID's electrification programs in other countries. In Bangladesh, the direct beneficiaries of the program are a small group of rich farmers who own the electric pumps — "all probably among Bangladesh's elite 10 percent."⁶⁴ In Costa Rica and Colombia, the benefits accrued to the relatively well-off owners of land, mills, and dairy operations.⁶⁵ In Indonesia, where the agency has committed a total of \$125 million for rural electrification, the chief of the USAID agricultural mission himself was forced to admit that the net impact of the project would be fewer jobs for the poor

in an area already characterized by a vast surplus of labor, because it would permit mill-owners to shift from labor-intensive to electric-driven, labor-saving rice mills.⁶⁶

Finally, AID also claims that rural electrification reduces deforestation and erosion by substituting electricity for wood in cooking fuel. However, the government figures shown in table 3 refute this claim. Nationally, less than 3 percent of the households use electricity for cooking; in the rural areas, less than 1 percent use electricity. As AID consultant Judith Tandler concluded, "In reality . . . not much is being achieved by rural electrification in the fight against deforestation and the "conservation benefit" is hardly worth mentioning."⁶⁷

Rural industry. "By providing cheap electrical power," the agency asserts in its 1977 project paper, "the rural electric program has provided the small entrepreneur a chance to compete in the market place and at least discourage monopolistic prices."⁶⁸ A more recent assessment, however, acknowledges that the program has not had much impact on "the establishment of new businesses. . ."⁶⁹ The basic problem for rural industries, planners must be reminded, is the lack of effective demand for the beverages, canned food, clothes, and industrial consumer items they would turn out. The bulk of the estimated 40 percent of the labor force which is unemployed or underemployed is in the countryside. In the last 25 years, these sectors have seen their real income decline, with landless farm laborers experiencing a steep 30 percent dive in their real wages.⁷⁰ Until a change in patterns of landownership and political power arms them with purchasing capacity, the link between electricity and rural industry will remain a utopian possibility.

Rural residential. In 1974, only about 7 percent of rural dwellings were electrified.⁷¹ Even the present effort to totally electrify the country by 1990 does not seem to be aimed at substantially altering this condition. As RAND analyst Guy Pauker notes, "Rural electrification does not seem to envisage actual introduction of electricity in village homes, judging from the estimated sectoral distribution of energy demand in 1987."⁷² Most of the electricity in 1987, he observes, will continue to go to the urban sector, and the vast majority of the rural population will still have no access to electricity in their homes.⁷³ Pauker concludes:

What rural electrification can hope to achieve, is availability of power in the villages, regardless of the volume of effective demand among the rural population which on the average will remain too poor to afford electric amenities in their homes.⁷⁴

USAID and the National Electrification Administration have spent thousands of dollars on nationwide surveys which reveal the obvious: Within electric cooperative areas, the beneficiaries of electrification are better off than the non-beneficiaries. According to one survey:⁷⁵

- 72 percent of electrified rural households have a combined income above \$533, which is above the national average household income;
- 82 percent of household heads have been educated above grade four;
- 70 percent earn their income from occupations other than farming;
- 79 percent live in solid housing;
- 69 percent own their own dwelling; and
- 79 percent live closer than two kilometers from a provincial road.

Clearly, this is not the profile of a tenant-farmer or rural laborer struggling to survive. It is the profile of a member of

Table 2. Philippines Electrical End-use by Sector (1974)

Rank	Percent Consumed	Sector
1	23.0	commerce, communications
2	15.7	energy producing industries
3	15.5	households
4	5.6	chemicals
5	5.2	textiles
6	5.1	non-metallic mineral products
7	4.8	fabricated metal products, machinery equipment
8	4.1	food, beverage and tobacco
9	3.9	construction, non-specified industry
10	3.6	iron & steel basic industries
11	3.2	mining (excluding fuels)
12	3.1	wood, paper, printing, publishing
13	2.6	public & street lighting
14	2.4	agriculture, irrigation, dewatering, fishing, forestry
15	1.8	non-ferrous metals basic industries
16	0.3	transportation

NOTE: Total consumption in 1974 was 12.4 billion kWh. Percents sum to 99.9 due to rounding error.

Source: Economic and Social Commission for Asia and the Pacific, *Electric Power in Asia and the Pacific*, UN, New York, 1976. p. 76.

regions with the threat of a power cut-off in the event of resistance.¹¹ In the Philippines, areas of significant guerilla activity, such as Bicol, Samar, and Lanao del Sur, are already being hooked up to central grids through the Rural Electrification program. At this time, however, it appears that electrical power is more valuable to the military than to the rebellious populations.

For technocrats, especially in a rigidly class-structured underdeveloped country like the Philippines, nuclear power is a resource which can be manipulated to gain entry into a power bloc traditionally dominated by strong political entrepreneurs and powerful economic interest groups.

All complex technologies require technological elites to operate and maintain them. This is at least as true for nuclear power as it is in the computer or aerospace field, for example. However, energy is particularly vital to a nation's life, since most other technologies and industries would be impotent without it and because an increasingly sizable portion of our social capital will be necessary for such high technology systems as nuclear power. This "elite" therefore exercises, perhaps unconsciously, an enormous amount of power and influence.¹²

AUTHORITARIAN POLITICS

Elites pursuing controlled development tend to support authoritarian regimes, which establish the "proper" political climate for economic development. Many have been directly influenced by the thinking of the neo-conservative development theorist Samuel Huntington, who argued in his celebrated work, *Political Order in Changing Societies*, that a precondition for economic development is the establishment of strong central political authority. Building authority takes precedence to the question of representation, which, in Huntington's view, is a luxury for most Third World countries or a complex, organic outgrowth of Western political development. For Huntington, and Marcos technocrats like O.D. Corpuz,¹³ the battle for democratic representation is an irrelevant Lockean prejudice and a disturbing variable in economic development.

Along these lines, the National Power Corporation's 1973 Power Plan actually predicated the success of electrification on the existence of the martial-law government:

During the period of martial law, decisions are being made to move the country forward economically. If these decisions are firmly rooted and well accepted by the majority at the time elections are once again held, the electrification program will move forward, and the loads for planning will undoubtedly develop and may indeed be exceeded. On the other hand, if martial law is ended prematurely and the economic decisions are reversed, the load may prove to be too high.¹⁴

In fact, the 1973 decision to go nuclear was made by one man, Ferdinand Marcos, with the advice of a tiny core of technocrats. With centralized decision-making, it was easy for Westinghouse to avoid a rigorous safety review. Furthermore, without public scrutiny and accountability, massive corruption was inevitable.

THE PEOPLE OF MORONG

Siting was also a centralized decision. The Marcos government did not seek the approval of the people of Morong, who were going to live in the shadow of the reactor. In the words of the head of the Philippine Atomic Energy Commission (PAEC), they were merely "simple folk,"¹⁵ who presumably lacked the capacity for an informed judgement. The

PAEC chief in fact, admitted that:

(The NPC), as evidenced by its initial actions, expropriation of private lands without satisfactory relocation measures and gathering of site data without associated public information program . . . entertained the belief that, being a government project and with a crisis government existing in the country, there is no need to convince the people about the necessity for the undertaking as there would hardly be any opposition to it.¹⁶

The townspeople first learned of the project during preliminary siting activities.¹⁷ Soon after, 36 households — a total of 184 persons — were uprooted and relocated; their fields were expropriated under "eminent domain."¹⁸ The opposition to these measures was so great that the NPC was forced to call a "public information" meeting, with military personnel present "for security purposes." Intimidated in such meetings, the townspeople began to gather on their own to discuss the economic problems and environmental hazards posed by the plant, at which point the military began threatening people who spoke out against it.¹⁹

Meanwhile, the impact of the reactor construction radiated beyond those who were immediately displaced. Ricefields and fish-spawning grounds were filled with sediment washed down from the construction site. Crops and fruit trees were bulldozed to widen roads to the site, and grazing land for cattle and water buffalo were expropriated. Finally, the NPC imposed restrictions on fishing and sea-food gathering, creating serious hardship in a town economy 80 percent dependent on fishing.²⁰

A Morong peasant summarizes the villagers' complaints:

Before, the fishermen used to fish near the shore. Now the National Power Corporation has driven the fish away because earth fillings are washed directly to the sea. Parts of the mountains abundant in fruit trees and other crops are already levelled off and are now replaced with NPC contractors' barracks. Since the town is near the plant site, we might get relocated. If so, where shall we get the livelihood to support our children? I hope that we will not suffer too much poverty and sickness in the future because of the National Power Corporation.²¹

The harassment of plant opponents took a turn for the worse when Philippine Constabulary troops in March 1978, arrested, tortured, and imprisoned a 23-year-old worker with Power Contractors, Inc., on unproven charges of being a



Reactor construction has nearly destroyed the once thriving fishing industry, source of livelihood for these vendors.

courier for the New People's Army and a saboteur.²² When Ernesto Nazareno reported back to the Constabulary a month and a half after his release, he disappeared — a victim, it is now feared, of the regime's notorious policy of "salvaging."²³ The repression intensified between July and September 1978, when the military conducted raids in Morong and three barrios:

These were conducted in the early morning hours and the men were asked to show their residence certificates or identification cards. . . . People feel more coercion and they notice more "peddlers" and strangers whom they suspect as informers.²⁴

CHICO DAM AND OTHER PARALLELS

The same pattern of imposition — resistance — repression has marked the activities of the National Power Corporation elsewhere in the archipelago. One of the best-known examples is the \$385 million Chico River Dam Project in the Mountain Province. The government planned and initiated construction of four dams without any input from local communities. The stakes were high for the people, however, since the project was going to flood 3419 square kilometers, displacing from their ancestral lands an estimated 100,000 members of two of the country's oldest and most famous cultural minorities, the Bontoc and the Kalinga.²⁵ The project threatened to submerge one of the most energy-efficient systems of agriculture — mountain-rice-terracing — and with it a whole socio-cultural system of communal labor and social relations.²⁶

At Chico River, development planners were willing to practice cultural genocide to serve an allegedly higher goal, "national energy needs." Bishop Francisco Claver, a Bontok who has emerged as one of the prime critics of martial-law development programs, poses the conflict:

The final questions as to human development arises then,

and has to be answered by all: "It is conceivable, the world-wide need of cheap energy being what it is, that the Chico River Project can be equated with national survival, and if so, then the rights — even the life itself — of a small segment of the population must give way to the more sovereign rights of the rest of the nation. But can this equation be made honestly? And is the rest of the nation willing to be party to the destruction of others of their kind in order for them to survive? This question must be placed to the nation at large."²⁷

In Mindanao, massive new hydroelectric projects also threaten ethnic minorities with cultural disintegration and displacement. To tap the hydroelectric potential of the Agus River in the province of Lanao del Sur, the NPC has expropriated the traditional landholdings of Maranao Moslems, by applying Western land-title requirements.²⁸ Faced with flooding and displacement by the construction of a giant dam at Lake Sebu, in South Cotabato, the T'boli people have articulated their stake:

This land and these lakes God has given us. We do not want this land to be destroyed by flood because it is precious to us. Our ancestors were born and buried here. We would rather kill ourselves and our children than witness the terrible destruction that this dam would bring.²⁹

The military is evicting a struggling marginal community in Kolambugan, Cagayan de Oro, to make room for an energy project — "tree planting for fuel" — of the National Electrification Administration and the Findlay Miller Lumber Company.³⁰

With no legal avenues for protest, these threatened minorities and communities have resorted to extra-legal and sometimes armed methods of opposing the energy bureaucracies. In the Chico area, for instance, the Bontok have employed both passive resistance — lying in front of bulldozers — and armed struggle — firing on NPC surveyors



New People's Army cadre engaged in political education with Igorot tribefolk opposing the Chico Dam.

and military men. Many Igorot and Bontok have now joined the New People's Army (NPA), the nationwide guerrilla force.³¹ In Suguiaran, Lanao del Sur, "it is no coincidence that eleven NPC employees and an unspecified number of soldiers have been killed in ambushes of vehicles and strafings of living quarters."³²

Faced with such resistance, government repression has increased. Construction sites and the surrounding areas have become virtual military camps. Resistance in the Chico Dam area became so widespread that President Marcos issued a special Letter of Instruction (LOI 220) threatening to arrest anyone who "interferes, prevents, obstructs or hinders" the activities of the NPC. No less than a full battalion of troops have been stationed among the Kalingas, and over one hundred opponents have been detained at the army provincial headquarters.³³ In Morong, Bataan, unrest became so severe that two companies of Constabulary troops are now reportedly stationed in the town.³⁴ And in Lanao, the close relationship between the NPC and the army has become symbolic of the social relationship between dictatorship and technocratic development:

Beside the NPC office building stands "Matatag" (29th Infantry Battalion) headquarters behind its sandbag bunkers. Its soldiers man checkpoints at each entrance and strategic crossing on the site, as well as patrol the perimeter and "maintain security" in the Saguiaran area.³⁵

After six years of top-down "development," the mystique of "the good of the national majority" — used to justify all forms of local socioeconomic disruption — has worn thin.

Electricity from Morong, people now realize, will not service their province but will go to run multinational-owned industries at the nearby Bataan Export Processing Zone. The reactor, if completed, will service the needs of the wealthier classes concentrated in Manila. The Igorots in the Chico area have resisted tenaciously, because they have understood the false equation of the "national good" with the electricity and water needs of private-interests: foreign mining firms operating in the area; a huge logging, sawmill, and papermill complex being set up near the dam area by Herminio Disini, the same Marcos relative who figured in the corruption in the Westinghouse deal; and the 22,000 hectares of land owned by the president himself in the adjoining Cagayan Valley.³⁶

Indeed, some technocrats who, years ago, started out with high, if misguided ideals, on the path of centralized, dirigiste development have begun to confront the reality that this pattern of growth has not contributed to the development capacities of a benign elite but to the growing concentration of political and economic power in a self-serving clique. Horacio Morales, formerly one of the top technocrats of the regime, upon going underground and defecting to the opposition National Democratic Front, cut through the development rhetoric:

(The Marcos regime is) a government serving the interests of the few. This illegitimate government was imposed on the people by Marcos and his clique of big landlords and big capitalists to promote their selfish interests and not to serve our people. They have used every ruse, deception, and trick to amass riches for themselves. The wealth of this clique is now well known.³⁷

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7. "Republic of the Philippines Atomic Energy Program," Philippine Atomic Energy Commission (PAEC), (Manila), May, 1977, p. 1.
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8. Home Defense, *Military Civic Action* (Manila: Armed Forces of the Philippines, undated), p. 166.
9. Cyrus Manzoor, "Politics of Technology Transfer," in *Proceedings of the Conference on Transfer of Nuclear Technology* (Tehran: Atomic Energy Organization of Iran, 1977), vol. 1, p. 205.
10. Dr. Robert Pahlke, quoted in *A Race Against Time*, p. 154-55.
11. As Zalmay Khalilzad points out, "This emphasis on electricity centralization has been accompanied by centralization of the electricity bureaucracy and general political centralization, involving increased political penetration and control of the rural areas and rural dependency on urban areas, especially on the capital cities." *Nuclear Power and Economic Development*, Panheuristics Report to US Arms Control and Disarmament Agency, Los Angeles, forthcoming.
12. *A Race Against Time*, p. 155.
13. See, for instance, O.D. Corpuz, "Liberty and Government in the New Society: An International Perspective on Contemporary Philippine Politics," Manila, 1974.
14. "Luzon Power Planning Study, 1973-1992," National Power Corporation (Manila), 1973, p. 169, mimeo.
15. L. Ibe et al., "Gaining Public Acceptance for Nuclear Power: the Philippine Approach," IAEA-CN-36/363, Vienna, 1977 (microfiche).
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22. Personal communication from key anti-nuclear activist, Manila, July 7, 1978; confidential statement of Ernesto Nazareno, April, 1978.
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24. Personal communication from anti-nuclear activist, September 8, 1978.
25. *Conditions of the Filipino People Under Martial Law*, Friends of the Filipino People — Anti-Martial Law Coalition Investigating Team (San Francisco), 1979, p. 13.
26. Charles Drucker, "The Price of Progress in the Philippines," *Sierra*, November-December, 1978, pp. 22-26.
27. Francisco Claver, "The Progress of the People . . . At the Nozzle-End of a Gun," *MSPC Communications* (January, 1978), p. 33.
28. Dansalan Research Center Team, "Our Land for Others," *MSPC Communications*, October, 1978, pp. 20-24.
29. "Two Voices, One Theme: Dams," *MSPC Communications*, January, 1978, p. 25.
30. *Philippine Times*, December 23-29, 1978, p. 6.
31. *Far Eastern Economic Review*, reprinted in *Philippine Times*, November 11-17, 1978, pp. 1-3.
32. Dansalan Research Center Team, p. 35.
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34. Personal communication from key anti-nuclear activist in Manila, November, 1978.
35. Dansalan Research Center Team, p. 35.
36. *Conditions of the Filipino People Under Martial Law*, pp. 14-15.
37. Horacio Morales, Jr., "The Failure of Development Programs Under the New Society," (mimeo) Manila, February 1, 1978.

Uranium Mines Threaten Native Americans

Nuclear power brings few benefits and many costs to Native Americans. Even the "least valuable land" onto which the Indian nations were thrust is now in demand for reactor siting, transmission lines and waste disposal. Fifteen Indian bands opposed Sundesert nuclear reactor in California. Vincent Ibanez, Chairperson of the Morongo Band said to the Sundesert hearings:

The Pachanga Band is extremely concerned about the effect that the entire Sundesert Project will have on archaeological sites throughout Southern California. All these lands are sacred to us because they were our ancestral homelands. . . . There are also burial sites scattered throughout the area which are sacred to us and should not be disturbed according to our religion. We do not believe that San Diego Gas and Electric is aware of the importance of our people in the history of this land. We have lived here for more than 20,000 years and our conservation practices preserved this land 'til the time of the White Man.¹

URANIUM MINING

The most direct conflict, however, is over uranium mining. Indian people, both collectively as nations and as individuals, own and control a substantial proportion of all U.S. uranium deposits.* The Grants Uranium Belt of northwest New Mexico, which encompasses the lands of Navajo and Pueblo Indian peoples, is the area of the most intense uranium mining and milling activity in the U.S.:

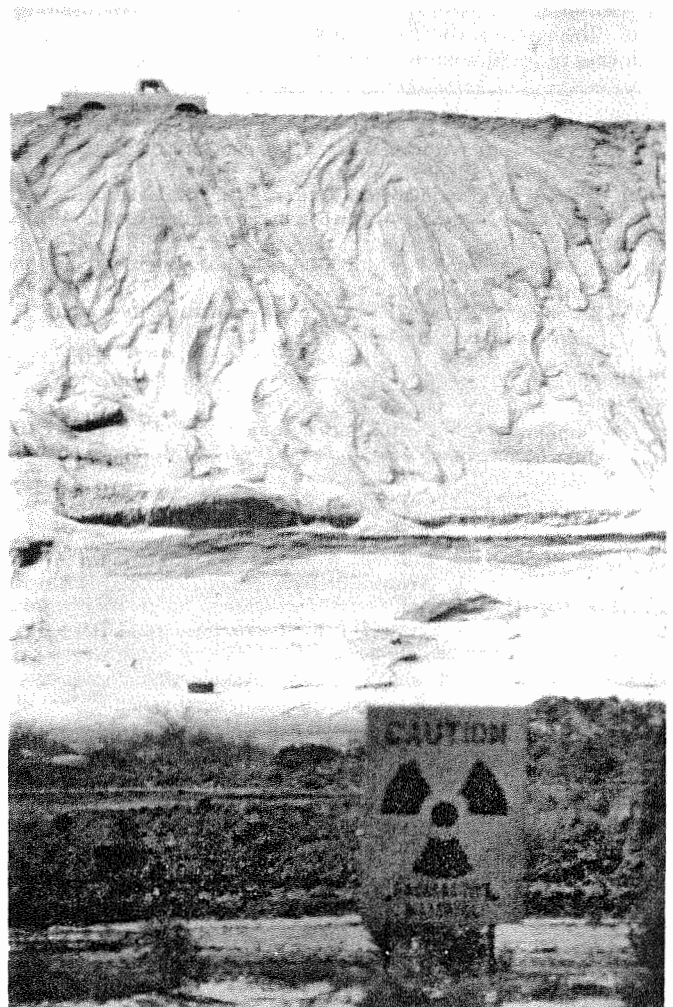
The Indian people have, more than any other group, felt the impact of the new search for uranium spurred by the growth of the nuclear power industry. In this uranium-rich region, over half of the uranium leases are on Indian land.

Thirteen companies account for all such leases, including powerful energy companies like Atlantic Richfield, Continental Oil, Exxon, United Nuclear, Kerr-McGee and others.²

Uranium mining, by any standard, is a massive and dirty activity. The uranium mines leave hundreds of millions of tons of unwanted tailings which emit the radioactive gas,

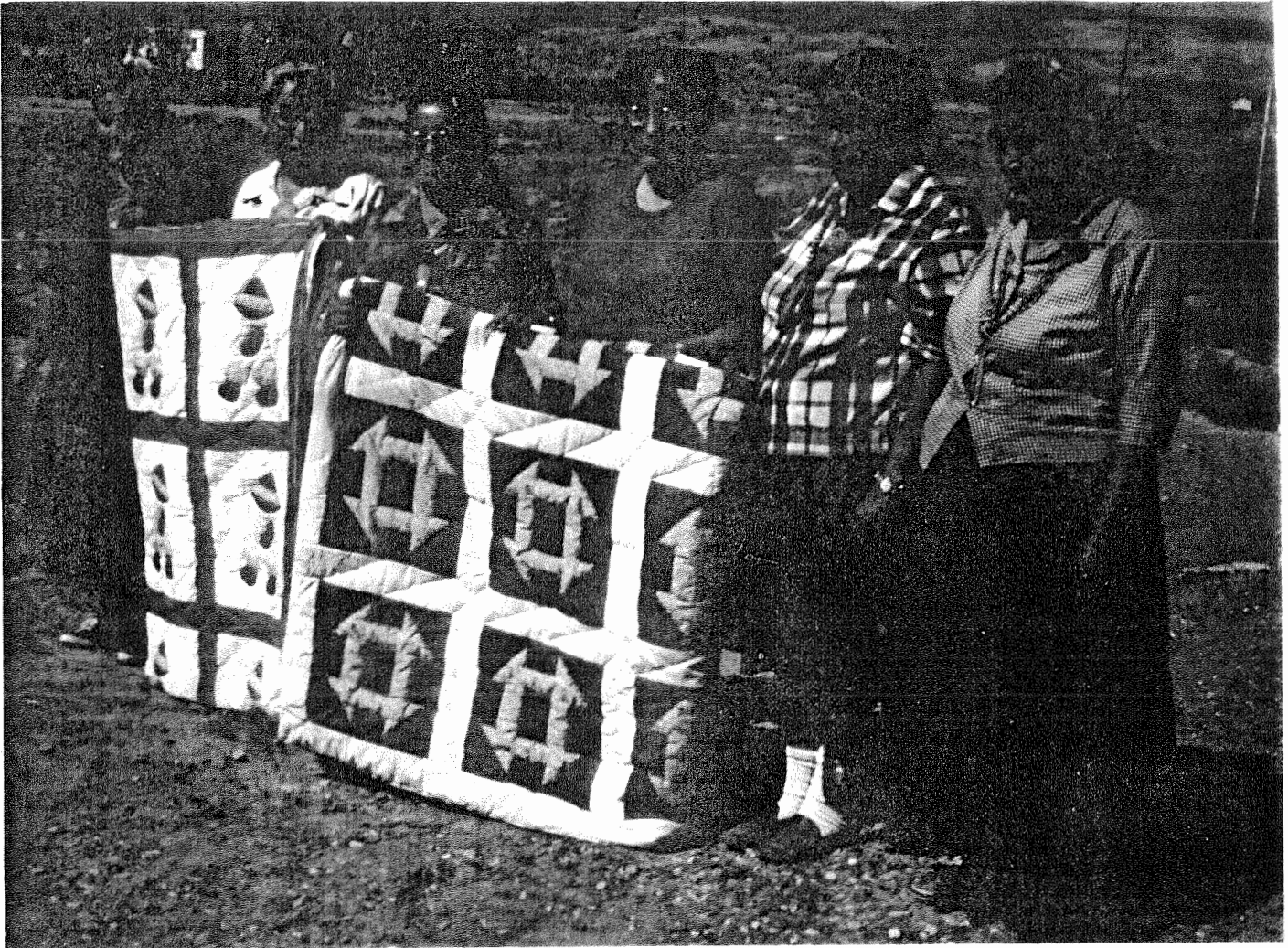
Where the uranium slag has been
dumped
Children wade in the water,
But break out in sores.

—Navajo Haiku



Uranium Tailings Dump, New Mexico

* A wide discrepancy exists in estimates of Indian-owned uranium in the U.S., with claims as high as 55 percent (Council of Energy Resource Tribes — Mineral Inventory on Indian Land). Winona La Duke asserts that Indians own 80 percent of the uranium in North America (Akwesasne Notes, vol. 11, no. 1). However, since reserves are rarely defined, these claims are meaningless. The U.S. Department of Energy — relying on proprietary and confidential corporate data — estimates that Indian reserves at \$15/lb. forward cost amounted to 13 percent of total U.S. reserves (370,000 tons of yellowcake) in 1977 and 11 percent at \$30/lb. forward costs. (E. Grutt, U.S. ERDA, letter to Americans for Indian Opportunity, June 17, 1977); and New Mexico Energy and Minerals Department, "An Overview of the New Mexico Uranium Industry," January, 1979, p. 20). The AEC estimated in 1975 that Indians held 16 percent of cheap uranium reserves — \$8/lb. forward cost. (Federal Trade Commission, "Staff Report on Mineral Leasing on Indian Lands," Bureau of Competition, 1975, p. 9). Probably only the big energy companies know the actual figures.



Navajo Widows of Kerr McGee Miners, New Mexico

radon. Paul Robinson at the Southwest Research and Information Center writes:

The dose from this radon source to populations at Papuate and Laguna has yet to be calculated. The State of New Mexico is only now beginning to gather radon concentration data after 26 years of open pit mining. The Federal Government has no monitoring plans; neither does the Laguna Pueblo. Thus, the impacts of open pit mining of uranium have been left unassessed and uncontrolled.³

Whole communities suffer from the uranium mining and milling. At Paguate village at Laguna, which the giant Jackpile Open-Cut Mine threatens to engulf altogether, a 100-million ton pile of uranium tailings blows radioactive dust everywhere.

Laguna Councilman Frank Aragon says:

You don't know what it's going to do to our health, especially to our kids and babies later on. It will soon be March and wind will really start blowing. People here dry their meat outside and dust settles on it. The uranium gets into our lungs and the food and our people.⁴

When the companies have finished mining, they leave the mess behind. Four piles of uranium mine tailings on the Navajo reservation, which the Energy Research and De-

velopment Administration (ERDA) concluded threatened public health, were abandoned in the 1960's.⁵ The Navajo Nation's cumulative royalties on the production equalled less than \$1 million, but stabilization of the wastes will cost up to \$21 million. The companies assume no responsibility; it has been left to the Navajos.⁶

Uranium mining also pollutes surface and underground water supplies for Indian domestic and livestock use with heavy metals and radioactive radium. In 1975, the Environmental Protection Agency (EPA) found that the United Nuclear Homestake Partners' uranium mill had polluted down-gradient water to 340 times the recommended maximum selenium concentration in drinking water.⁷ Water collected from one of the mobile homes supplied by the company's mine water supply systems contained selenium and radium levels grossly exceeding health standards. R. Kauffman re-

No one has come around to tell us about the effects of uranium mining and milling — there was just this one man that came around, but he had a hard time talking Navajo so we really didn't understand him.

Eleanor Arviso
Dalton Pass Navajo Chapter
April 9, 1978

ports that the Church Rock minewater threatens potable water around Puerco River and possibly the Gallup municipal supply.⁸ EPA itself concluded:

Company-sponsored groundwater monitoring programs range from the inadequate to the non-existent. . . . Compared to the multi-million dollar uranium industry, producing multi-billion liters of toxic effluents, the groundwater sampling or monitoring programs represent minimal efforts in terms of network design, implementation and level of investment.⁹

According to the EPA, New Mexico and federal reports are incomplete and disorganized. There has been essentially no review, in any critical sense, of company operations with respect to groundwater contamination. The uranium mining and milling industry has not been pressed to monitor and protect groundwater resources.¹⁰

LUNG CANCER VICTIMS

At Laguna Pueblo, one in ten tribal persons work in the mine, and one in four in the workforce is or has been a uranium miner. One study of Navajo miners at the Kerr-McGee mine at Cove showed that 18 out of 100 had already died of radon-induced lung cancer and 21 others have developed malignancies. Unfortunately, this is not an isolated pattern.¹¹

Since 1971, when cancers started to appear, the affected Navajo communities have demanded compensation, including proper mine closure, refuse stabilization, and just compensation to disabled and dying workers and to heirs of those already dead.¹² Kerr-McGee refuses liability and has never replied to the people's request. Dr. Husson, from Shiprock Hospital, says:

The thing that really makes it bad is that the guys that were ambitious and went out there and got those jobs are paying for it now. Seems like there's no justice anywhere. You work for the White Man and what do you get? Cancer.¹³

Although the U.S. Public Health Service warned State Health officials about radiation hazards as early as 1950, no action was taken. Up to 1967, an interlocking network of federal agencies were responsible for mining and radiation jurisdiction, but none had jurisdiction over implementation of health standards in the mines. The 1967 Metal and Non-Metal Safety Act gave authority for all uranium mine regulation to the Bureau of Mines; a mandatory federal radiation standard, however, was not enforced until 1971.¹⁴

The New Mexico State Labor Board has rejected the com-

There's no question this is a white man's job. The Navajos sat on these uranium deposits for a thousand years and didn't do anything with them. Uranium has always been here and the Indian has been here for a thousand years and nothing happened till twenty years ago.

A mine official cited in L.J. Gibson (ed.), *That's the Kind of People They Are - The Uranium Belt of Northwestern New Mexico as Seen Through the Eyes of the People Who Live There*, Working Paper No. 44, San Juan Basin Regional Uranium Study, Box 1590, Albuquerque, New Mexico, 87103, 1979, p. 18.

pensation claims of Navajo widows. One woman, Betty Yazzie, lost two husbands to radon-induced lung cancer.¹⁵ Her remaining avenue for compensation is to file suit against the Bureau of Indian Affairs, for acting on behalf of the uranium industry instead of fulfilling its trust responsibility to protect Indian interests. In part because they have no guarantee of compensation, many miners are reluctant to undergo medical examinations which might jeopardize their employment.¹⁶ Delayed diagnosis, of course, means a reduced chance of successful treatment.

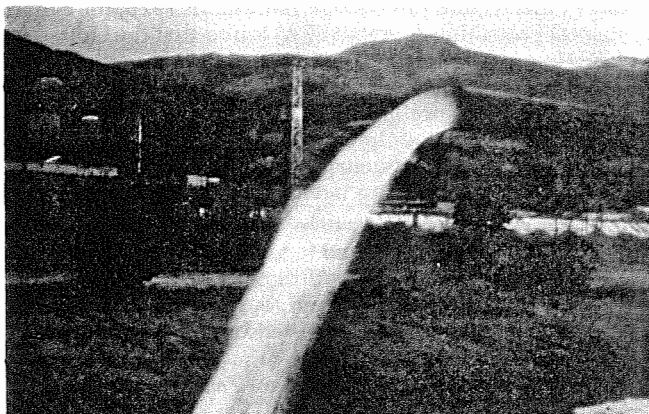
INDIANS FIGHT BACK

"There are many Navajo and Pueblo people in the Grants Mineral Belt," states the National Indian Youth Council, "who consider the uranium mining activity on Mount Taylor a violent act of sacrilege and desecration visited upon a sacred shrine."¹⁷ Gulf Oil is currently drilling two 3300-foot-deep mine shafts into this sacred mountain, which has become a rallying point for Indians and non-Indians alike. A regional council, representative of the Pueblo and Navajo peoples in the Grants area and including major Indian organizations, formed to organize a three-day protest against uranium mining near Mt. Taylor on April 28-30, 1979. Local alliances with Chicano and anti-nuclear forces were expanded in an effort to focus national and international attention on the front-end of the nuclear power and weapons fuel-cycle.

Grassroots opposition to uranium mining is also growing in South Dakota, where exploration activity in the Black Hills is already underway. The Black Hills Alliance, a coalition of Indians, environmentalists, ranchers and anti-nuclear activists, called a national conference in Rapid City in late March, 1979. They drew up plans for legal, educational and political actions to prevent the mining of uranium, as well as coal and taconite, in the traditionally sacred Black Hills.

Oponents of uranium mining, in both South Dakota and New Mexico, have started an international educational campaign. Recognizing that the transnational character of the nuclear industry necessitates internationally-linked resistance, they are building ties with anti-uranium movements in Australia, Namibia, and Canada. In all these countries, indigenous peoples, whose continued existence as individuals and as cultures is at stake, form the core of the resistance. But increasingly, non-Aboriginal people of the land, as well as the general public, are joining to demand alternatives to the nuclear path. The Cameron Navajos say:

Uranium is a deadly poison whose extraction can only lead to further sickness among the people and destruction of the land. . . . (The community) has resolved to undertake intensive food and forage production as an explicit alternative to allowing the uranium mines to re-open. Alfalfa and corn sustain life, and the benefits of fertile soil and



Illegal Water Pollution At Gulf Oil Mine Site, Mt. Taylor

flourishing rangelands extend far beyond the present generation.¹⁸

SOVEREIGNTY — AN ANTIDOTE TO GENOCIDE

Native American lands in North America are rich not only in uranium but in coal and oil. Many Indians fear that the massive escalation of mining called for by President Carter's "Project Independence" will cause the destruction of their total land base within 25-35 years. Such devastation amounts to cultural genocide since, as one activist put it, "An Indian without land is not an Indian."

While the American Indian Movement (AIM) has resisted federal and corporate encroachment on Native lands since 1968, it was not until recently that Indians understood that the demand for energy resources was its primary cause. Indeed, it now appears that the internationally known case of Leonard Peltier, an AIM activist tried and convicted of the murder of two FBI agents on the Pine Ridge Reservation in 1975, is linked to uranium. On the same day that a shoot-out between FBI forces and an Indian spiritual camp occurred, one-eighth of the Pine Ridge Reservation was signed away to

It was a very happy thing that happened two or three years ago when the non-Indian people saw it was necessary to ally with our Indian people, Santo Domingo. We joined forces and we battled against the Occidental (Corp.) This is a very good coalition because the non-Indian citizens within the area couldn't do anything on their own without the help of us and we couldn't succeed without the help of them. So it's a good alliance and we should maintain that momentum. We got to make a united front against those corporations. We're not afraid of anybody. I think we know the strategies so we can whip them. With knowledge and faith and trust, you can go a long way."

Ernest Lavato
Spokesperson
Santo Domingo Pueblo
September 23, 1978

Only since Watergate and since Harrisburg has the rest of the non-Indian general public begun to question the motives of the Federal Government and the multinational energy corporations. Only recently have white ranchers, white farmers really begun to feel like Indians — with their rights trampled on, with their lives and their land in clear and present danger. . . . We need to come together, because our interests are congruent.

John Redhouse
American Indian Environmental Council
April 1, 1979

the U.S. Government. In late 1978, investigations revealed that the land in question — the Sheep Mountain Bomber Range — is being intensively explored for uranium.

Energy corporations gain access to reservation land by signing leases with tribal councils, without the consent or often even the knowledge of local Indian people. The councils are administered by the Bureau of Indian Affairs (BIA) under the U.S. Department of Interior, which has final jurisdiction over council decisions.

The Indian Reorganization Act of 1934, established the tribal council structure. It imposed a model of tribal governance patterned after the U.S. government — an elected tribal chairman, a tribal constitution, etc. — facilitating the exploitation of Indian lands by outsiders.¹⁹ Historically, however, Indian nations governed themselves by consensus. Many Indians consider the council structure alien and do not vote or participate in their "government" in any way.

AIM and other activists see sovereignty as the cornerstone of their resistance to uranium mining. "The issue is one of control," says Paul Smith of the International Indian Treaty Council. "Uranium should not be mined at all. But BIA-controlled solar technology would still mean that we are colonized and exploited."

Indigenous peoples, who see themselves as sovereign nations, are fighting more than resource development and for more than a voice in the political system. Their struggle for self-determination is essentially a fight for their survival as a people.²⁰

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2. T. Barry and B. Wood, "Uranium on the Checkboard: Crisis at Crownpoint," *American Indian Journal*, June, 1978, p. 10.
3. P. Robinson, "Open Pit Uranium Mining in New Mexico," memo, June 30, 1978, SWRIC, Albuquerque, p. 4.
4. T. Barry, "Laguna Pueblo: At the Center of the Uranium Boom," Albuquerque, 1978, p. 8.
5. "Uranium Mining and Milling Environmental Effects Program Plan," State of New Mexico, Health and Environment Department, Environmental Improvement Division, Radiation Protection, June, 1978, p. 42.
6. R. Nafziger, "Uranium: A Brief Overview," in M. Gover (ed.), *You Don't Have to Be Poor to Be Indian*, Americans for Indian Opportunity, Albuquerque, 1978 (forthcoming).
7. R. Kauffman et al., "Effects of Uranium and Milling on Ground Water in the Grants Mineral Belt, New Mexico," *Ground Water*, Volume 14, September-October, 1976.
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11. C.J. Sternhagen, "The Current Status of Lung Cancer in Uranium Mines in New Mexico" (mimeo), Department of Radiology, University of New Mexico, paper presented to American Industrial Hygiene Conference, Florida, May, 1974.
12. Resolution, Dalton Pass Chapter of the Navajo Nation, December 13, 1971.
13. Letter from M.M. Key, U.S. Assistant Surgeon General, to the Hon. G. McKay, July 24, 1973, p. 2.
14. In A. Spake, "Navajo Miners and Lung Cancer," *The Washington Post*, June 9, 1974.
15. T. Barry, "The Navajo Lung Cancer Widows," *The Navajo Times*, August 24, 1978, p. B-13.
16. C.J. Sternhagen, p. 6-7.
17. Press release, June 24, 1978.
18. Circular, "Uranium Mining in Cameron, Navajo Nation," March 20, 1978, attachment to letter from J. Seronde to P. Robinson, May 25, 1978.
19. For further detail, see the excellent compilation, David Weiss, "The Hour Is Late: Native Americans and Energy Resource Development," Senior Thesis, Environmental Studies Library, University of California, Santa Cruz, California, 95060.
20. For an introduction to the conflicting interpretations of the concept of sovereignty, see V. Deloria, "Self-Determination and the Concept of Sovereignty," in *Economic Development in American Indian Reservations*, Native American Studies, University of New Mexico, 1812 Las Lomas Dr., NE, Albuquerque, NM, 87131, 1979, pp. 22-28.

Australian Uranium Connection

In Australia, Aboriginal lands contain about 80 percent of the world's cheap, uncommitted uranium. The Aboriginal people consider uranium mining a threat to their existence as a society, so they are fighting plans by the Australian government and multinational mining companies to develop their lands. The conflict is particularly sharp in a 140-kilometer long strip in the Northern Territory called "Uranium Province," home to 800 people plus numerous non-resident traditional owners. Within this small area, Getty Oil (U.S.) and Pancontinental (Canada) are poised for intensive mining at Jabiluka; Queensland Mines (Japan) at Nabarlek; Exxon (U.S.) and Urangesellschaft (W. Germany) at Yeelirrie.¹

LAND RIGHTS VS. MINERAL RIGHTS

Australian law separates landownership from the right to exploit minerals found in the land, which belongs to the Crown. However, the landowner's degree of control over mining remains ambiguous. As uranium companies invaded their traditional lands, the Aborigines, through the official Northern Lands Council, have struggled to gain control over mineral exploitation or at least a veto over government and company plans. To eliminate the legal ambiguities stalling mining operations, the Liberal-Country Party Coalition steered through the Australian Parliament the now historic Land Rights Act of 1976, which "... ensured that the Aborigines had no power of veto at all over practically all the major mining, oil and gas ventures on land claimed (or which will be) by Aborigines in the Territory."² Though it gave Aborigines the trappings of ownership and control, "... about all the Aboriginal Land Rights Act of 1976 will do for Aborigines so far as uranium is concerned is to guarantee them compensation — monetary compensation, of course."³

CULTURAL GENOCIDE

Though presently expressed in a legal struggle between land rights and mineral rights, the issue boils down to a fundamental conflict between the capitalist imperative of the

nuclear industry and the survival of aboriginal society. This conflict, moreover, takes place in the historical context of the 190 years of white colonization and domination of Australia's Aborigines.⁴

Numbering 300,000 at the advent of colonization in 1788, Australia's Aborigines have been reduced to 160,000 people of Aboriginal descent. White settlers have occupied most of the fertile parts of the country, pushing Aborigines back into what were initially perceived to be the least desirable sections of the continent, like the Northern Territory. With the discovery of valuable mineral deposits in these lands, however, the Aborigines again became the victims of encroachment, with the predators this time being multinational corporations instead of settlers and sheepfarmers.

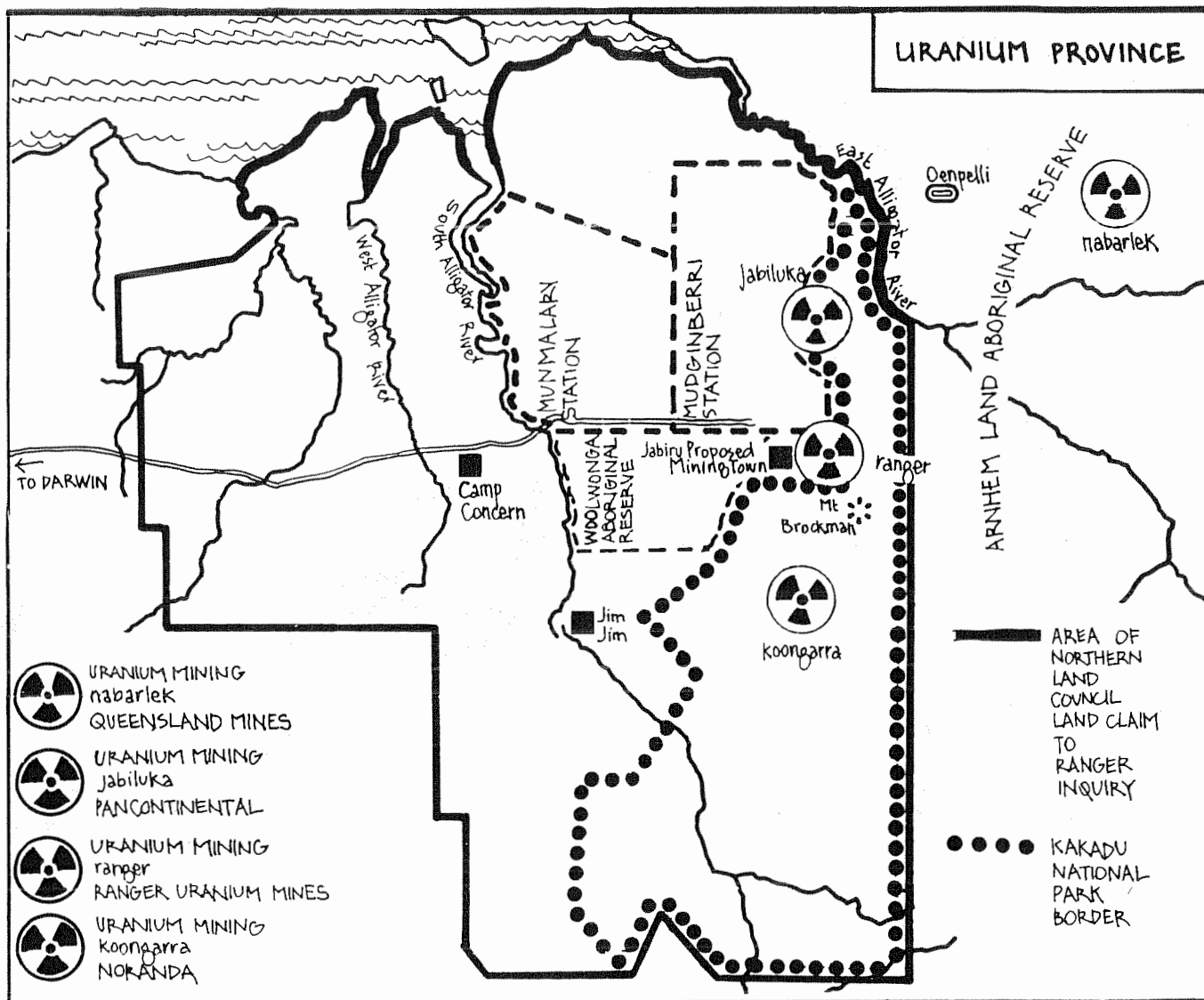
The battle-lines are clear. The Fox Commission (Ranger Inquiry), a liberal-dominated body designated by the government to come up with conclusive recommendations on the issue of land rights and mineral rights, reported:

The Aborigines do not have confidence that their own view will prevail; they feel that uranium mining development is almost certain to take place at Jabiru, if not elsewhere in the region as well. They feel that having got so far the white man is not likely to stop. . . Having in mind, in particular, the importance to the Aboriginal people of their right of self-determination, it is not in the circumstances possible for us to say that the development would be beneficial to them.⁵

But the Commission nonetheless concluded:

There can be no compromise with the Aboriginal position; either it is treated as conclusive or set aside. We are a tribunal of white men and any attempt on our part to start what is a reasonable accommodation of the various claims and interests can be regarded as white men's arrogance or paternalism. Nevertheless, this is the task we have been set. We hope, and have reason to believe, that the performance of our task will not be seen by Aboriginal people in a racial light at all. That our values are different is not to be denied, but we have nevertheless striven to understand as well as can be done their values and their viewpoint. We





have given careful attention to all that has been put before us by them or on their behalf. In the end, we form the conclusion that their opposition must not be allowed to prevail.⁶

Although uranium mining would not strip the Aboriginal people of their property rights outright, it would disrupt their tie to the land, which lies at the very basis of Aboriginal society. Aborigines, who came to Australia more than 40,000 years ago, live in close harmony with their natural environment. Land is sacred, sustaining the group not only physically, but spiritually as well. "She (the Earth) is the source of our true beings, our soul and life," one Aboriginal representative asserted eloquently at the Ranger Inquiry in 1976. "From her we have our traditional dreaming places, our most sacred areas and the keeping places of our lore."⁷ Or as Galarwuy Yunupingu, spokesperson of the Northern Lands Council, puts it:

The land is my back-bone. I only stand straight, happy, proud and not ashamed about my colour because I still have land. The land is the art. I can paint, dance, create and sing as my ancestors did before me. My people recorded these things about the land this way, so that I and all others like me may do the same. . . .⁸

The communally owned land is not a commodity which can be alienated, bought, sold, or leased. Thus, the monetary compensation offered by the government and the companies is entirely inadequate. "It is only when we lose our land and our culture," asserted Silas Roberts, another member of the Northern Lands Council, "that we have a greater need for money."⁹

The conflict between the corporate culture, which considers objects only as commodities, and Aboriginal culture, which values particular objects in themselves and sees them as part of the essence of human existence, is painfully evident at the three major mining sites: Ranger, Nabarlek, and Jabiluka.

RANGER: DESECRATION AND DISASTER

The Ranger Project Area, covering 83 square kilometers and estimated to have a lifetime of 30 years, borders on the sacred dreaming places of the Aborigines on the face of Mount Brockman. The sites are the Djidbidjidbi, a sacred presence in the form of a big quartzite boulder on the rubble slopes; and Dadbe, the Rainbow Snake, a deep rock hole with permanent water on which blue water lilies float. It is said that if Dadbe or Djidbidjidbi is desecrated, the whole country

will be wiped out.

Possible damage to these sites by blasting at the mining site close by (confirmed by the official Ranger Inquiry),¹⁰ has been a major cause of Aboriginal opposition to the project. In addition, Aborigines have been alarmed by a number of environmental hazards which the official investigation confirmed: contaminated water from the mines seeping into the regional Magela drainage system; air pollution caused by the emission of sulphur dioxide; and radioactive releases of yellowcake dust, radon, and dissolved radium.¹¹

The government has relentlessly pushed for a mining agreement despite Aboriginal resistance and the questions raised by scientific assessments of the impact of the project on the habitat. Its latest attempt to circumvent community opposition came at a surprise signing it staged in early November, 1978, after which the government trumpeted that it had bagged the "historic" Ranger mining agreement, in spite of the fact that only four of forty traditional landholders were present to initial the document. The "agreement" had the Aborigines losing on almost all counts. Royalty payments, for instance, were stipulated at a low 4.5 percent, instead of the 10 to 15 percent which the Council had demanded in the event the project was unstoppable. Though the remaining landholders were outraged over the government's haste and deception, it is likely that the mining will occur as planned.¹²

RESISTANCE AT NABARLEK

In Oenpelli, the Aborigines have confronted Queensland Mines, which has, through prospecting, already disturbed the sacred sites of Gabo Gjang, which are of major religious significance:

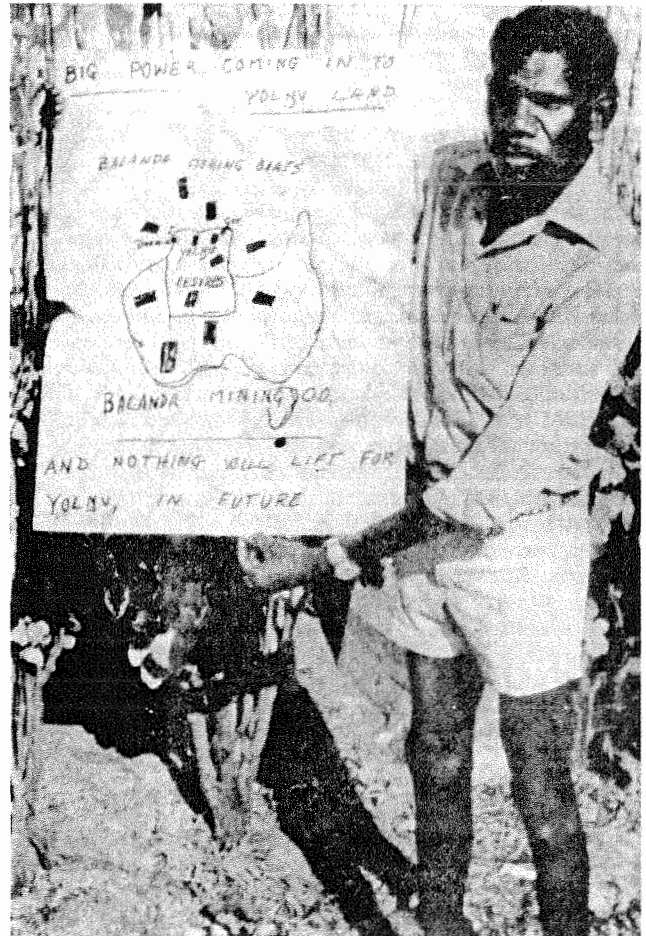
At Gabo Djang, the Aborigines believe that the one-centimeter-long insects that give the site its name are descendants of the Great Green Ant. They revere the great ant as one of the beings that established all the patterns of human life. They also believe that if the hallowed ground is desecrated the green ants will turn into monsters that will ravage the world. If the proposal to mine the uranium goes ahead the Aborigines' fear of an ensuing catastrophe would well be justified.¹³

The Oenpelli Council made clear that uranium mining meant cultural genocide:

If Oenpelli had the power to make the final decision, it would oppose mining. During Council discussion, the Chairman (Mr. S. Maralngurra) stated, "balanda (white men) push, push, push — soon pubs everywhere and they



Mt. Brockman Sacred Site



will kill the race. Look at the Larrykeahs — Darwin is their country and they are living on the tip."¹⁴

The mining company reacted in the same way that U.S. companies have to Native American opposition — by invoking "equal rights to land" and claiming "reverse discrimination." A newspaper advertisement taken out by Queensland Mines could well be mistaken for one by Anglo mining interests in Arizona:

50,000 Australians (Queensland Mines Shareholders) demand equality with Aborigines. The uranium cannot be mined because a small group of Aborigines now say they don't want it mined.¹⁵

It appears now that at Nabarlek, as at Ranger, the government will be able to force the aborigines to allow the mining.¹⁶

JABILUKA: LAST STAND?

Perhaps the biggest confrontation developing between the government and mining interests, on the one hand, and the Aborigines, on the other, is that over Jabiluka. The mining project, which is the biggest mine proposed on Aboriginal land, is a 65-35 joint venture of Pancontinental Mining Lts. (Canada) and Getty Oil (U.S.). The companies propose to construct a 2.5 square kilometer permanent dump for 520 million tons of radioactive uranium waste. Even the government has criticized the company's design for this dump as inadequate to prevent seepage of contaminated water into the

region's natural drainage system.¹⁷

The Environmental Impact Statement prepared by Pancontinental provides a classic example of the wide gulf that separates capitalist from Aboriginal interests. In the first place, the report was prepared without any consultation of the Northern Lands Council or the traditional owners. It stated:

Until the recent renewal of interest in the region due to the discovery of uranium there were virtually no social or community facilities or amenities in the region beyond those of the Oenpelli Mission.¹⁸

To this classic expression of ethnocentrism, the Aborigines replied that they "... have a special attachment to the land of the region and from their point of view the land is possessed of a complete range of community facilities and amenities."¹⁹

The Northern Lands Council is totally opposed to the project. It has developed a united front, encompassing labor and environmental groups, to negotiate with the companies and the government on the basis of strict adherence to the Ranger Inquiry's recommendations for environmental protection and sequential mining. In response, the Fraser Government has passed new repressive legislation indicating its determination to smash any opposition — black or white. Under the Land Rights Act, which forces Aborigines to negotiate with the companies, the Government can circumvent Aboriginal opposition by appointing an independent arbitrator to "act on behalf of" Aborigines. Wielding this whip, the Government permitted Pancontinental to proceed with test drilling at the Jabiluka site in mid-1978.

The Aborigines of Uranium Province may choose to make their final stand at Jabiluka. This determination, carrying with it implied threats of extra-legal action, was expressed by the NLC spokesperson Galarawuy Yunupingu: "Those areas are sacred to us. We won't let the government mine them."²⁰

The Northern Lands Council clearly summarizes the dilemma minorities face everywhere:

The economic dependence of Aboriginal people in the region is directly proportional to the degree to which they are prevented from using their land. They are prevented from using their land by the intrusion onto it of technically powerful, non-Aboriginal forces. Economic independence, of the type supposedly to be made available by the (Pancontinental) project, is really cultural enslavement to the Aborigines. Aboriginal people are not yet corrupted by the lure of commercial blandishments offering an ever-increasing variety of emptiness. They have the land and its areas, its fish, fowl, and animals; all of them unpolluted, unpackaged and always available — at least up till now.²¹



Oenpelli Children

Nevertheless, the aborigines are prepared for generations of resistance. Frank Gunnunga, an elder of the Oenpelli Community said:

Oh, we'll stop it all right. Don't worry, because I can push and push and push and push before I die. And when I die, I got my youngsters to push and push, I got my six children, three boys and three girls, they can push and push. And when they die, when my kids die, we got my grandchildren to push and push.²²

1. "Exxon Unit, German Firm Plan Uranium Site in Australia," *Wall Street Journal*, August 16, 1978, p. 12.
 2. "Aboriginaland," *Chain Reaction*, Volume 2, Number 4, 1977, p. 12.
 3. *Ibid.*, p. 14.
 4. The best general introduction is J. Roberts, *From Massacre to Mining*, (War on Want, 467 Caledonian Road, London N79BE, 1978).
 5. Fox Commission, *Ranger Uranium Environmental Inquiry, Second Report* (Australian Government Publishing Service, 1977), p. 9.
 6. *Ibid.*
 7. "Aboriginaland," p. 6.
 8. G. Yunupingu, "A Letter from Black to White," *Land Rights News* (Darwin), No. 6.
 9. Northern Lands Council, *Final Submission to Ranger Inquiry*, 1976, p. 13.
 10. Fox Commission, pp. 87-89, 159.

11. *Ibid.*, pp. 75-160.
 12. Steve Zorn, letter to Galarwuy Yunupingu, October 23, 1978; R. Graves, "Ranger: The Events Behind the Signing of the Agreement," *Chain Reaction*, Volume 4, Number 2-3, 1978, pp. 46-66.
 13. Wieslaw Lichicz and Stephen Myers, "Uranium Mining in Australia," in Mary Elliott (ed.), *Ground for Concern: Australia's Uranium and Human Survival* (Penguin, 1977), p. 52.
 14. *Ibid.*, p. 61.
 15. *The Australian*, May 13, 1974, p. 16.
 16. *The Age* (Melbourne), November 6, 1978.
 17. Fox Commission, p. 142.
 18. Cited in Northern Lands Council, "Comments on the Jabiluka Project Draft Environmental Statement," February 2, 1978, p. 1.
 19. *Ibid.*
 20. "NLC Plans to Block Uranium Mining, Northern Territory News," April 4, 1978.
 21. *The Age*, October 3, 1978.
 22. Friends of the Earth (Australia) interview tape, Nabarlek, 1975.

Rad-Waste Dumping in the Pacific

By building reactors before the problem of spent-fuel disposal is solved, the Philippines, Taiwan, Japan, and other nations of the Pacific are creating a radioactive time bomb. When nuclear fuel is spent, it must be either stored, or reprocessed and disposed. In either case, it is necessary to develop sites where radioactive wastes can be isolated from the natural environment for a period of at least 250,000 years, after which radioactive decay will be negligible. The U.S. itself has not yet established a satisfactory permanent nuclear waste dump, and the problems are even greater in Asia. Because of the population densities and geologic risks, no East Asian nation wishes to locate a reprocessing or dump site within its boundaries. The most likely spots are in the Pacific, either on an island controlled by the U.S. or in the sea-bed itself.

REPROCESSING

Reprocessing separates spent nuclear fuel into two streams: plutonium and unfissioned uranium, which can be recycled as fuel; and radioactive waste. Asian nuclear officials hope to set up a reprocessing plant to serve the region. David Chu, of the Taiwan Power Company, states:

Spent-fuel reprocessing, a necessary link in the fuel cycle for nuclear power generation, is presently missing. This problem is now being confronted by all (Asian Countries with) nuclear power development commitments. The logical solution appears to be establishment of a regional reprocessing plant through international cooperation among the Asian countries and (the U.S.).¹

Takao Nakajima reports:

(Japan) has been keenly concerned with this matter. In fact, the private industrial circles, who have been studying this problem among themselves, already have indicated their intention to participate in an international spent-fuel reprocessing plant, should such a project materialize.²

In explaining its own reactor, the Philippine National Power Corporation tells the Philippine public that reprocessing is already arranged:

After two or four years, the uranium fuel is spent and this is replaced. This spent fuel is removed from the reactor and sent to the U.S. for reprocessing. After reprocessing, the plutonium and uranium and the waste are returned to the Philippines. The uranium is used as fuel and the waste will be contained in thick concrete which will be buried deeply in a special place selected by the government.³

In fact, the Philippines has no provision for disposal or storage other than the reactor itself, which can handle thirty years of accumulated spent-fuel rods and 2½ years of low-level wastes.

Furthermore, the U.S. opposes fuel reprocessing, ostensibly because it increases the risk of undesirable parties and

governments obtaining fissionable materials to construct nuclear weapons. At any rate, regional reprocessing would diminish American control over nuclear materials, regardless of use. In April, 1977, the Carter administration halted domestic nuclear reprocessing and established the policy of storing spent fuel as is. Because the original fuel sale contracts give the U.S. control over the disposition of spent fuel, the U.S. can require East Asian countries to follow that U.S. policy. Japan has been shipping spent fuel to Britain and France for reprocessing, but it is likely that the U.S. will veto such shipments in the future.

SITES

Because reprocessing necessitates storage of both spent-fuel and low-level wastes, the site requirements for reprocessing and direct dumping are similar.⁴ Although the technologies for safe, long-term waste storage have not been developed, it is clear that any potential dump site must be situated away from concentrations of population and away from unstable geologic formations. Librado Ibe, head of the Philippine Atomic Energy Commission, assessed the problem more honestly than the NPC:

There is no known stable salt rock formation in any of the islands. For this reason, our hopes for the long-term storage and ultimate disposal of nuclear wastes will be on the establishment of an international waste burial site.⁵

As one U.S. senior arms control official stated, "Lots of people (in Washington) have world maps pinned to their walls trying to identify sites."⁶ In the non-Communist West Pacific, Australia is the most logical spot, because of its size and population density, but Australia is currently opposed to building a major nuclear dump. To U.S. policy-makers, however, Australia "still looms large every time we talk about these questions. Any news that Australia might change its position is very encouraging."⁷

Senator Edward Kennedy, among others, proposes a site in Micronesia, the U.S. Trust Territory in the Pacific. In early 1978, he told a Japanese audience that the U.S. and Japan should establish spent-fuel storage there.⁸ Taiwan's David Chu proposed Guam or the Northern Marianas, part of that Trust Territory, for a multinational fuel reprocessing center:

In principle, the regional plant should be established in the Western Pacific Region. One or more small islands that are quite isolated from major population centers and belong to American territory might be the right choice for the plant site. . . . The use of American land as the plant site will doubly assure the effectiveness of safeguards inspection and prevention of diversion of the sensitive nuclear materials. If no American territory in the Western Pacific Region is suitable for the intended purpose, the alternative could be some island purchased by the regional members and entrusted to American administration.⁹

Japanese sources have also mentioned Micronesia. In June, 1978, *Mainichi Daily News* reported, "The U.S. has asked Japan to take a strong initiative to construct a nuclear fuel center in the Pacific region. . . . The Marshall Islands and Caroline Islands are likely to be the location."¹⁰ More recently, the *Japan Economic Journal* disclosed:

It was revealed on March 15 that the U.S. Department of State asked the Japanese government to cooperate in a plan to build an international spent nuclear fuel storage center on Wake Island. . . . It was asked that Japan cooperate not only in surveying and building the center, but also in its future operations. . . . Wake Island is an important U.S. strategic outpost in the Pacific. Since most of the population are U.S. military personnel, the island is considered as one of the best places to store spent fuel safely, preventing "nuclear hijacking."¹¹

More important, there are not many civilians around to object, and Wake is a directly controlled U.S. territory, not part of the Trust Territory. It should take more than a year to survey the Wake Island site and its capability for storing the projected wastes from Pacific Rim nuclear reactors.¹²

Pacific Islanders are better organized than they were when the U.S. dropped the first H-bomb on Bikini Atoll in the Marshall Islands. They are likely to resist nuclear dumping in the region. Whether they are successful will depend both on the support they get from more populous regions and on the magnitude of the nuclear waste needing storage.

The mid-plate/mid-gyre great circular current of the major oceanic basins are the most stable and perhaps otherwise useless regions on earth. . . . The central North Pacific — the largest mid-plate/mid-gyre region in the world — is one suitable and convenient area for the initiation of seabed disposal studies.

—from W. Bishop and C. Hollister,
"Seabed Disposal — Where to Look,"
Nuclear Technology, December, 1974

UNDERSEA DISPOSAL?

Should the disposal of nuclear wastes on land prove politically impossible, segments of the "nuclear community" appear prepared to establish dumps beneath the oceans:

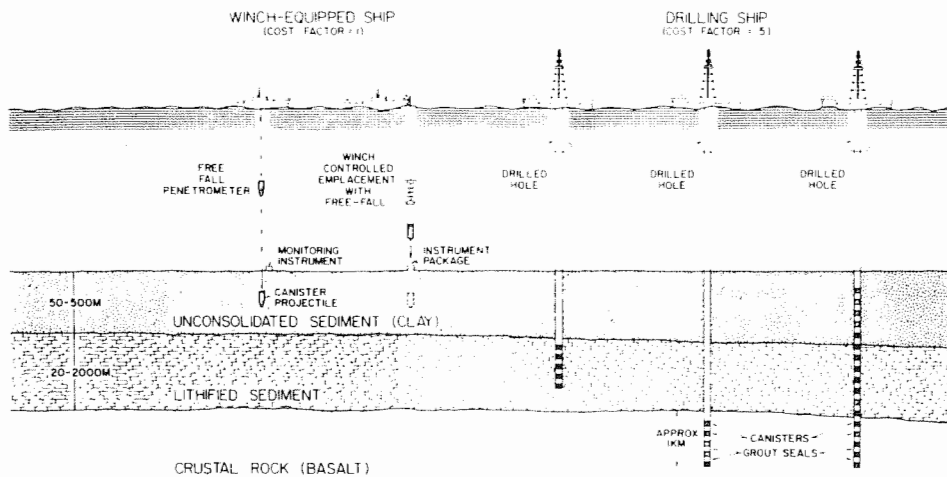
The potential advantages of seabed disposal include remoteness from current human activities, the potentially high isolation capability of ocean sediments, the high heat sink capability of the ocean, the large areas available, and the possibility of avoiding the problems of finding and gaining access to adequate terrestrial disposal sites.¹³

The U.S. is considering seabed disposal for its own radioactive wastes:

It is possible, even with reasonable technical assurances that repositories in the United States would be safe, that



Rural Palau



Engineering Concepts for Seabed Radioactive Disposal

the public will prefer that the wastes be kept outside the country. This feeling may well be exaggerated by the "don't put it in my backyard" kind of politics that we are already familiar with.¹⁴

Sub-seabed disposal has been intensively investigated since 1973.¹⁵ The technology involves placing canisters of nuclear rad-waste in sediments of rock at depths of 18,000 feet, where they must remain isolated for over a million years because of slow decay rate and high levels of radioactivity.¹⁶ Early in the studies, it was determined that the advantages of this method of disposal included:

Distance from habitation; depth of water; constant conditions (temporally and geographically); geologic stability (seismic and sediments); predictability (lack of cataclysmic events); sparse biology; large dispersal medium (as a last resort).¹⁷

Still, many environmental and engineering aspects remain

unsolved. And, if the technology fails, the "last resort" may become a devastating reality. "Radionuclides in solution in the deep ocean . . . might be expected to reach the sea surface in 3000 years or less."¹⁸

TIME IS SHORT

Each new reactor intensifies the waste storage and disposal problem. The Japanese have determined that they have to know by 1985 where their spent fuel will be disposed, since they have limited storage. If the U.S. forces the Japanese to forego reprocessing, the need for storage will increase.

As the magnitude of radioactive waste mounts, the pressure to dump it someplace will increase correspondingly. Pacific Islanders and others near potential disposal sites recognize that once a disposal site is used, it is contaminated. Because the safest solution to radioactive waste is to prevent additional reactors from producing it, the peoples of the Pacific find themselves in a natural alliance with the peasants of Morong and nuclear critics around the world.

1. D. Chu, "Regional Spent-Fuel Reprocessing in Asia," in R. Farmakers (ed.) *Proceedings of the First Pacific Basic Conference on Nuclear Power Development*, American Nuclear Society (Hawaii) October, 1976, p. 433.
2. Takao Nakajima, "Japan's Spent-Fuel Reprocessing Program and Regional Planning," in Farmakers, p. 427. "The Japanese," says the Interagency Review Group on Nuclear Waste Management, "are also interested in regional arrangements for activities associated with the back end of the fuel cycle and in seabed as well as island disposal concepts." ("Report to President," October, 1978, TID-28817 (Draft) p. 9-7.)
3. "Questions and Answers About Nuclear Power," National Power Corporation (Manila), 1978, p. 14.
4. "Reprocessing high-level waste has lower actinide content than spent fuel, but miscellaneous transuranic waste is created as a result of reprocessing and refabrication; on balance the two waste disposal situations are comparable." *Review of Modern Physics*, American Physical Society, January, 1978, part 2, p. S8.
5. M. Richardson, "Philippines Eyes Australia as Likely Site for Nuclear Waste Disposal," *Australian Financial Review*, May 31, 1978.
6. Telephone conversations with senior officials at U.S. Arms Control and Disarmaments Agency, November 4, 1978.
7. *Ibid.*
8. *Honolulu Star Bulletin*, January 1978.
9. Chu, p. 437.
10. *Mainichi*, June 11, 1978.
11. *Nihon Keizai Shimbun*, March 15, 1979.
12. The *Washington Post* (March 29, 1979) reports that the U.S. is considering several Pacific island sites, but has ruled out Wake.
13. Interagency Review Group on Nuclear Wastes Management, "Subgroup Report on Alternative Technology Strategies for the Isolation of Nuclear Waste," October, 1978, TD-28818 (Draft), Washington, D.C. P. A-3.
14. R. Frosch, "Disposing of High-Level Radioactive Waste," *Oceanus*, vol. 20, no. 1., 1977, p. 15.
15. American Physical Society, "Report to the APS by the Study Group on Nuclear Fuel Cycle and Waste Management," *Review of Modern Physics*, January 1978, p. S-117.
16. C. Hollister, "The Seabed Option," *Oceanus*, Volume 20, number 1., 1977, p. 23.
17. W. Bishop and C. Hollister, "Seabed Disposal — Where to Look," *Nuclear Technology*, December, 1974, p. 440.
18. American Physical Society, p. S-117. Among the unsolved problems of seabed rad-waste disposal are:
 - (1) transport and emplacement hazards at 18,000 feet
 - (2) geological stability and predictability of the seabed
 - (3) container breaching rate, immigration of rad-waste in sediments, effect of thermal energy on upwelling of wastes
 - (4) biological effects of possible rad-waste dispersion on high species diversity and low species population communities in abyssal oceans
 - (5) preclusion of other uses of seabed (petroleum, nodules, wilderness).
 See also "Subgroup Report. . . ." pp. A-4, A-5.

Liberating Energy

People develop, not things. Energy use must be evaluated as a means of achieving human goals, rather than as an end in itself. Because values differ, there is no single "development" path, along which all societies travel and ultimately converge. There are, however, some material and economic requirements shared by all cultures. One of these is the availability of adequate energy to sustain society.

Differing forms of energy are appropriate for different ends. One must distinguish between the means (such as energy) and the ends (not including energy), or the energy forms may be used to realize the wrong objectives. This is the case in the Philippines, where centralized electrification supports economic, political, and social oppression.

Energy technologies provide the means for people to work by converting high-grade fuels and other sources into lower-grade energy forms and, ultimately, into heat. Each source — be it dung, coal, wood, food, or electricity — provides energy of a different quality, appropriate for specific tasks.¹ Electricity is an *efficient* way to power some tools (e.g. to drill holes in steel) and is *necessary* for some activities (e.g. telecommunications). However, electricity is generally an *inefficient* way to provide thermal energy, especially for cooking, which predominates in the energy budget of the poor. The qualitative relationship between the type of energy (electrical, mechanical, chemical, thermal, nuclear) and the nature of the work task requiring energy conversion is an important consideration generally neglected in energy in-

vestment decisions.

Because the rich and the poor, or the politically strong and weak, have different needs and aspirations, they demand divergent energy policies and technologies. In the Third World, the rich need oil for private cars; the poor need oil for public transit. The rich need electricity for air conditioners, stoves, refrigerators, TVs, vacuum cleaners, etc.; the poor need electricity for one or two 40-watt light bulbs.

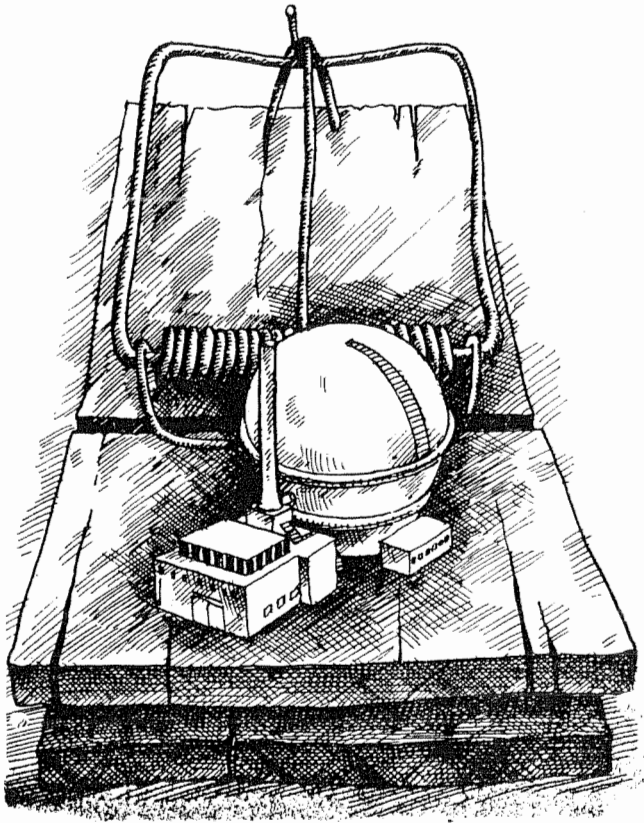
Social conflict over energy would be unnecessary if energy investment resources were unlimited. Then, one could simply follow Philippine "First Lady" Imelda Marcos' dictum, "There are no longer any priorities. Everything is a priority."² In the real world, however, priorities are ranked through the exercise of political and economic power by opposing classes. Energy policy, therefore, is necessarily value-laden, whether or not the values are explicit.

The provision of more electricity may, depending upon the circumstances:

- 1) improve or frustrate equity — the fulfillment of the needs of the neediest;
- 2) increase or decrease individual, local, and national self-reliance; or
- 3) improve or destroy the environment.

It is evident that the production and consumption of electricity in the Philippines has increased inequity, dependence, and environmental destruction. Nuclear-generated electricity, it appears, will have all the same negative results.





SOFT ENERGY ALTERNATIVES

Throughout the world, opponents of nuclear energy and other centralized forms of power generation are promoting alternative, "soft" energy forms such as wind, solar power, wood, waste recycling, geothermal, etc. Under a different social and political structure, these technologies could increase equity and independence in the Philippines, but under the current system they provide limited benefits.

USAID, for instance, allocated \$10 million in 1978 to fund a "Non-Conventional Energy Program" in the Philippines. Virtually all projects in this program do nothing for the poor.³ Indeed, AID admits, "The research program itself will not greatly involve nor affect the poor."⁴

Most villagers are too poor to purchase biogas digesters. The World Bank loan of \$4 million for woodfuel and charcoal production in Northern Luzon excludes poor peasants and mountain people from traditional woodfuel supplies while benefiting capitalist farmers, the tobacco industry, and chemical companies.⁵ AID is funding a large-scale woodfuel project, but it is for the generation of electricity, which benefits the rich.

Alternative energy programs are as entangled in Martial Law politics as nuclear and oil power. The \$10 million New Zealand-funded geothermal program on Leyte Island commands special attention merely because it "is the birthplace of the First Lady, Imelda Romuladez Marcos."⁶

In pursuing non-conventional energy technologies, Filipino technocrats maintain the same sycophantic attitude that characterizes their more conventional energy programs:

It is very unlikely that local efforts would significantly contribute, much less make a breakthrough, in this (Research and Development) area. . . . A better strategy is to keep a close watch of progress abroad. . . .⁷

But non-conventional energy forms, such as solar power, can be developed anywhere. Two Brazilian authors argue:

What appears as a pragmatic and shrewd position (with respect to solar technology is a rather fallacious and self-defeating argument because, unlike nuclear power . . . solar energy in many of its applications is not extremely dependent on previously developed complex technology.⁸

Human and draft animal labor, charcoal, wood, and agricultural wastes are the energy base of the poor, and they are not presently utilized efficiently. If traditional agriculture and energy forms are taken as a starting point, the Philippines can circumvent the "energy crisis." But it will take more than the good intentions of soft energy buffs at USAID. The neocolonial structure which has determined to build the Bataan Reactor will continue to frustrate equitable, self-reliant, safe energy development until it is changed politically.

AN INTERNATIONAL PROBLEM

The nuclear industry is more than a series of companies and national agencies. *Nuclear News* editorializes:

There is a diminution in the size and number of the clusters of people who consider themselves part of one country's nuclear community and separate from the world's nuclear community. Nuclear energy is international in almost every aspect, and our vision and involvement are drawn across national boundaries as never before.⁹

Third World nuclear specialists are trained at the Vienna headquarters of the International Atomic Energy Agency (\$20,000 for three weeks!) and in various U.S. programs. These include the Argonne National Laboratory, near Chicago, Westinghouse, at Zion, Illinois, and General Electric in San Jose, California. 4,255 nuclear technologists from the Third World were trained in the U.S. between 1955 and 1977.¹⁰ They all returned home with the "doubtful word that nuclear power is a modern and inevitable form of energy," and the notion that "Nuclear energy is something special and . . . therefore its practitioners must be special."¹¹

The transfer of nuclear technology," said a nuclear producer in 1974, "is an exercise in human relations."¹² Three value orientations link nuclear producers and consumers in an international community. The first, espoused by nuclear technologists, is pursuit of technical advances such as precision and technical efficiency, or "technological progress." These values are transferred through publications, symposia, and migration, and they are embodied in exported machinery, licensing procedures, provision of technical assistance, etc.¹³

Technological progress is the means of attaining the second goal, "modernity," that state of nuclear Nirvana towards which American culture rushes. "Energy," says nuclear apostle P. Searby, "provides the power to progress." Only with energy "properly applied" can a person "rise from subsistence level to the highest (sic) standard of living."¹⁴ "It is time," said a Bechtel vice-president in 1976, "to take justifiable pride in our technological accomplishments. It is time for us all to become zealots."¹⁵

Coupled with the notion of linear, convergent "progress" and "modernity" is a third value orientation: national chauvinism. Nuclear power is a short-cut to national prestige. Walter Reuther commented as far back as 1955:



The first country that gives an atomic reactor to an underdeveloped country in Asia or Africa will win a psychological advantages that has as much power as the H-bomb.¹⁶

More recently, the Indian National Committee on Science and Technology asserted:

India has already been classified by the IAEA as the ninth most developed country in the world in the peaceful uses of atomic energy. . . . There are immense prospects of extending assistance to other developing Afro-Asian countries . . . and improve (sic) our international image considerably.¹⁷

"Progress," "modernity," and national chauvinism are so closely intertwined with the development of nuclear power that opposition to nuclear power, consciously or unconsciously, challenges the essence of the relationship between the rich nations and poor nations of the world.

THE GROWING OPPOSITION

It is not surprising, therefore, that the anti-nuclear movement is international in scope. Even though most nuclear critics in the developed countries have not paid much atten-

tion to nuclear exports, their arguments have been heard in the Third World. Many Third World nuclear promoters complain that the controversy over nuclear energy in the "First World" has released "fall-out" of its own into the Third World. For example, M. Islam states:

The growth of opposition to nuclear power in the developed countries . . . has had its adverse effect on the public in Bangladesh. The views of the anti-nuclear lobbies tend to be accepted as the TRUTH. The slow-down in ordering for nuclear stations in the U.S.A., the U.K., and Sweden has been taken to mean that there are as yet unsolved problems in the utilization of fission power.¹⁸

With the growth of anti-nuclear forces in the Philippines and other Third World countries, as well as First World nations, the nuclear opposition is becoming consciously international. Because single projects, in various stages of their fuel cycle, involve such distant yet similar peoples as the Aborigines of northern Australia, the Native Americans of New Mexico, the Filipinos of Morong, and the islanders of the Pacific, the links are growing.

In the Philippines, just as in the U.S. or Australia, energy is a question of political power, not merely technology. In uniting across national boundaries, it will become increasingly clear to the anti-nuclear movement that it too must address political issues, such as Martial Law in the Philippines. When it has defeated the nuclear industry, the transnational anti-nuclear movement will have established the basis for a new order, where people will relate to each other over long distances by choice, instead of being thrust together in struggle by the dictates of profit and chance.



1. American Physical Society, "The Study Group on Technical Aspects of Efficient Energy Utilization," *Physics Today*, August, 1975.
2. Quoted by J. Leviste, "Energy and the Survival of Humankind," *Silingan* (Manila), volume 2, number 1-2, 1977, p. 45.
3. "The National Non-Conventional Energy Resources Development Program," Philippines Department of Energy, January, 1978.
4. "Philippines Non-Conventional Energy Development," Project Paper, USAID/DLC, p. 2288, 1978, annex p. 3.
5. "Philippines: Appraisal of the Smallholder Treefarming and Forestry Project," World Bank report number 1969a-PH, November 4, 1977, pp. 8-9.
6. A. Ravenholt, "Energy from the Heat of the Earth," *Southeast Asia Series*, volume XXV, number 5, March, 1977, p. 1.
7. "National Non-Conventional Energy Resources Development Program," p. 12.
8. A. Pereira and J. Warkov, "Toward an Interdisciplinary and Comparative Approach and Study of Energy for Rural Development in Semi-Arid Areas of Northeastern Brazil," paper presented to the International Conference on Bio-Resources for Development, Houston, Texas, November, 1978, p. 6. For example, it took Chinese researchers to develop an appropriate biogas storage design, radically reducing cost and complexity, while Indian researchers struggled with an expensive, complex West German design. See M. McGarry and J. Stainforth, "Compost, Fertilizer, and Biogas Production from Human and Farm Wastes in the People's Republic of China," Ottawa, ADRC-TS8e, 1978.
9. *Nuclear News*, August, 1976, p. 29.
10. C. Long, "Nuclear Proliferation: Can Congress Act in Time?" *International Security*, Spring, 1977, pp. 60, 62.
11. *Ibid.*, p. 61.
12. E. Perryman, "Technology Transfer," Atomic Energy of Canada, Ltd., Paper No. 4769, 1974, p. 13.
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The drive against nuclear exports and uranium mining is an international effort. Among the groups which have been active in this effort are the following:

Abalone Alliance
944 Market St.
San Francisco, CA. 94102

American Friends Service Committee
2160 Lake St.
San Francisco, CA. 94121

American Indian Movement
c/o 1812 27th Ave.
Oakland, CA. 94601

Amis de la Terre
117 Av. de Choisy
75013 Paris, France

Campaign for a Nuclear Free Philippines
3508 Lowell St. NW
Washington, D.C. 20016
Tel. (202) 363-0643

553 30th St.
Oakland, CA. 94609
Tel. (415) 451-9069

Canadian Coalition for Nuclear
Responsibility
2010 Mackay St.
Montreal, Quebec, Canada H3G 2J1

Center for Development Policy
225 Fourth St. NE
Washington, D.C. 20002

Clamshell Alliance
62 Congress St.
Portsmouth, New Hampshire 03801

Coalition Against Uranium Mining
1523 A Josephine Street
Berkeley, CA. 94703
Tel. (415) 843-0973

Friends of the Earth Australia
232 Castlereagh St.
Sydney, New South Wales 2010, Australia

Friends of the Earth USA
124 Spear St.
San Francisco, CA. 94105

Friends of the Filipino People
1322 18th St. NW
Washington, D.C. 20036

International Association of Filipino Patriots
P.O. Box 24737
Oakland, CA. 94623

Jishu Koza
Masafumi Takubo B
Kaikan, Nishi Okubo 2-350
Sinjukuku, Tokyo, Japan

Movement Against Uranium Mining
277 Brunswick St., Fitzroy
Victoria 3065, Australia

Natural Resources Defense Council
917 15th St.
Washington, D.C. 20005

Nautilus Collective
1523 A Josephine St.
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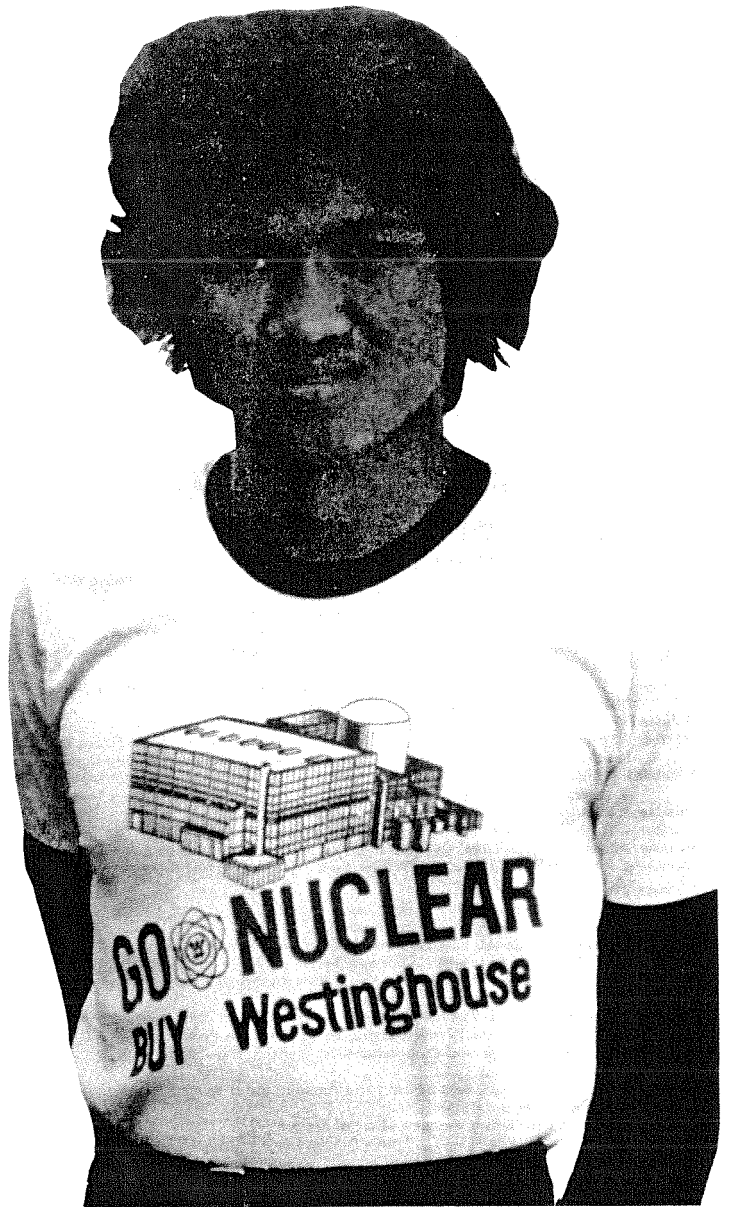
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1208 Massachusetts Ave.
Cambridge, MA. 02138

Union of Democratic Filipinos
3600 Lincoln Ave.
Oakland, CA. 94602

The Bataan Death Machine

We hope this cry of anguish reaches you:
 In the name of progress,
 The "New Society" will build
 On our land—
 A land sheltered for centuries by nature
 And cultivated by tender human hands—
 A machine of fire and death.
 What devilish conspiracy is it
 That would place a nuclear dome
 On the slope of a volcano, beside
 An earthquake fault, on a coast
 Prey to tidal waves and typhoons,
 Among people ravaged by malaria
 And stunted by malnutrition?
 We are not against progress that brings life.
 We stand against "progress" that sows death!
 We swear one thing: We'll pile our battered bodies
 On every road and every alley
 To block the coming of the deadly presence.
 We ask of you, citizens of the world,
 Only one small thing: Can you lend us a hand?
 Today, the nuclear madmen have elected us.
 Tomorrow, it could very well be you.

(Free translation of sections of
 "Historical Bataan" by an anonymous
 poet from Morong, Bataan)



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