

Chapter 3

THE RISE OF THE ANTINUCLEAR POWER MOVEMENT 1957 TO 1989

In this chapter I trace the development and circulation of antinuclear struggles of the last 40 years. What we will see is a pattern of new sectors of the class (e.g., women, native Americans, and Labor) joining the movement over the course of that long cycle of struggles. Those new sectors would remain autonomous, which would clearly place the movement within the autonomist Marxist model. Furthermore, it is precisely the widening of the class composition that has made the antinuclear movement the most successful social movement of the 1970s and 1980s. Although that widening has been impressive, as we will see in chapter 5, it did not go far enough, leaving out certain sectors of the class.

Since its beginnings in the 1950s, opposition to the civilian nuclear power program has gone through three distinct phases of one cycle of struggles.⁽¹⁾ Phase 1 —1957 to 1967— was a period marked by sporadic opposition to specific nuclear plants. Phase 2 —1968 to 1975— was a period marked by a concern for the environmental impact of nuclear power plants, which led to a critique of all aspects of nuclear power. Moreover, the legal and the political systems were widely used to achieve demands. And Phase 3 —1977 to the present— has been a period marked by the use of direct action and civil disobedience by protesters whose goals have been to shut down all nuclear power plants.

3.1 The First Phase of the Struggles: 1957 to 1967

Opposition to nuclear energy first emerged shortly after the atomic bomb was built. The Franck Report of 11 June 1945, signed by a number of Manhattan Project scientists, warned Secretary of War Stimson that an unannounced bomb attack would lead to an arms race. Nevertheless, significant antinuclear opposition did not emerge until the late 1950s. The hydrogen bomb test (1 March 1954) on the Bikini atoll made the world conscious of fallout for the first time. Fallout from the explosion rained onto the Marshall Islanders and a Japanese fishing boat, the Lucky Dragon. Shortly thereafter a handful of North London housewives started a committee to pressure the U.S. government to stop its weapons testing—thus began the test-ban movement. That committee later became the National Campaign for Nuclear Disarmament (CND), of which Bertrand Russell (philosopher-mathematician) was the moving spirit.⁽²⁾

The British ban the bomb movement resulted in large marches from Aldermaston to London, in protest of the American Polaris missile base in Scotland and the use of Britain as an American military arsenal. It was in the vanguard of the international *antibomb* movements of the 1950s because of its use of demonstrations, marches, mass actions, and nonviolent civil disobedience. Although the American test-ban movement was unable to match the much greater intensity of the British movement, it provided the base from which struggles could circulate to the civilian nuclear power program. Almost two decades later struggles would circulate from a vigorous antinuclear power movement back to the antibomb movement.

3.1.1 The U.S. Fallout Controversy

Radioactive fallout was first detected in the United States at Troy, New York in 1953, which was the result of a nuclear test in Nevada. Immediately physicists across the country became concerned about Strontium 90 because it posed the greatest threat—a threat which the AEC ignored. For instance, while the AEC issued warnings about strontium 90 in milk supplies, it ignored its presence in meat. Strontium 90 lodges in the bones of animals. After it is butchered radioactive bone splinters remain in the meat. In 1956 Barry Commoner was asked to supply information on fallout that was sent in the form of a letter to the Democratic candidate for president, Adali Stevenson. In a campaign speech Adali Stevenson read from that letter, reproaching the Eisenhower administration for its continuance of atmospheric tests. This marked the first time that a technological question had been raised in a presidential campaign. In 1958 Commoner became the moving spirit in the creation of the St. Louis Committee for Nuclear Information whose aim was to keep scientists constantly in touch with interested laypersons. The work of the St. Louis Committee was significant because it began the process of demystifying the atom and breaking

through the government's atomic secrecy. It also established a pattern for the fledgling antinuclear movement—that of getting out nuclear information to the public.(3)

Not only did the AEC consistently downplay the dangers of radiation poisoning from fallout, but it also hid damaging information about nuclear power from the public. For example, Hilgartner et al. have characterized the use of two teams of radiation monitors as “One of the most insidious elements of the AEC's public relations campaign.” While public teams went into the communities near the test site (without any protective clothing), the secret teams (wore full protective gear) operated outside the communities, going into the hotspots in the desert. The information they gathered was never released to the public because it was classified by law.(4) Indeed, it was dissident scientists who were the first to warn the public of leukemia, bone cancer, and long-term genetic damage (e.g., Herman Mueller, Noble Prize winner) from nuclear testing.

The campaign against the testing of nuclear weapons was waged by citizens' groups such as the Committee for a Sane Nuclear Policy (SANE) and Women's Strike for Peace (WSFP). On 15 November 1957 SANE published a full-page advertisement in the *New York Times*, which was instrumental in creating the movement. By the summer of 1958, SANE had 25,000 members and 130 local chapters. In May 1960 a SANE-sponsored rally in New York's Madison Square Garden attracted thousands of people. SANE relied on the political and moral suasion of such notables as Albert Schweitzer, Norman Cousins, Dr. Eric Fromm, and Clarence Pickett of the American Friends' Service Committee as well as on its access to sympathetic politicians.(5) Unlike the more centralized SANE, WSFP was a grassroots movement which had started in the Washington, D.C. area in 1961. Because they believed that their children were threatened, some women across the country announced that they were on strike. WSFP was successful in organizing demonstrations in 60 cities involving 50,000 women.(6) Writer Grace Paley also became involved in the movement. In the late 1950s through her poems she fought against the Atoms for Peace Program activities at the Brookhaven Atomic Energy Laboratory in Long Island, which were killing nearby forests. In addition, in 1961 she cofounded the Greenwich Village Peace Center which focused on antiwar and antinuclear politics.

However, the movement was unable to stop the dumping of U.S. radioactive wastes into the ocean until the late 1960s. But one local group was successful in stopping the practice in their area a decade earlier. In 1959 a Cape Cod citizens' group forced the AEC to stop the illegal dumping of radioactive wastes into the nearby Atlantic.(7) Another group, Physicians for Social Responsibility (PSR), was instrumental in pressuring President Kennedy to sign the Limited Test Ban Treaty in 1963, ending superpower atmospheric testing. PSR was started in 1961 by a small group of Boston physicians who were concerned about the health effects of atmospheric testing and the lack of available data concerning these effects. After the treaty was signed, PSR remained largely dormant (except for a period in 1968-1969) until 1978 when Dr. Helen Caldicott helped to revive the organization.

Ironically the Partial Test Ban Treaty led to the waning of the movement. A limited victory combined with an overemphasis on the problems of fallout left the movement without an effective strategy.(8) And later the Vietnam War was to take center stage. For example, like many others, Grace Paley focused her efforts on the antiwar effort, while neglecting antinuclear work. She says “It's really too bad that this happened to all of us because it was also during this time that so much escalation took place in the nuclear industry.”(9) Nonetheless, the disarmament movement reappeared in the 1980s as the Freeze movement as a reaction to the decision by western allies to place Pershing and Cruise missiles in Western Europe. By 1984 the movement had peaked after failing to stop the installation of those missiles. However, in a few places such as Greenham Common (England) and Seneca Falls (United States), both women's peace camps, the movement still flourishes.

3.1.2 The Reactor-Siting Controversy

In the first phase, opposition to nuclear power plants was local and sporadic; the main issue was the effects of individual plants on the surrounding environment. Protest was aimed at individual reactors, and at a small group of capitalists. For instance, opponents of Fermi 1 in Detroit and Ravenswood in Queens argued that the plants threatened the health and safety of large populations. At Bodega Head and Malibu in California, the major concern was the protection of the natural environment.(10) In addition, the farming population around some proposed reactor sites feared the further industrialization of the area and the destruction of its economic base and way of living also took up the struggle with stiff local resistance. Real estate owners objected to the visual impact of nuclear power plants on the natural landscape. Fishermen were concerned about the consequences of thermal pollution. In this phase the movement obtained only a few victories. In particular, local citizens groups were

successful in cancelling projects at Ravenswood, Queens in 1962; at Bodega Head, 50 miles north of San Francisco in late 1964; and at Malibu and Eugene, Oregon in 1967. Through the persistence of a few individuals, the movement learned that both Bodega Head and the Malibu site were situated on earthquake faults. And construction of Meshoppen, the first nonexperimental breeder reactor (supported by President Kennedy) in Wyoming County, Pennsylvania was also stopped; the project was re-sited to Clinch River, Tennessee because of local grassroots pressure. However, a full-blown critique of nuclear power would have to wait until the 1970s.

The movement was aided by the publication of several studies that supported its contentions about the health hazards of nuclear reactors. Perhaps one of the most famous was the study by Ernest Sternglass of the University of Pittsburgh, who showed an increase in cancer deaths due to radiation from nuclear power plants and which also linked nuclear reactors with infant deaths. Moreover, a six-year study which had been commissioned by the AEC in 1963 proved highly damaging to the agency. Dr. John Gofman and Dr. Arthur Tamplin, two of the world's most prestigious scientists, questioned the AEC's radiation standards, and called for a tenfold reduction in the AEC's permissible dosage levels. Unable to tolerate any dissent from inside the agency, the AEC retaliated against the two scientists—taking away their funding and staff. Dr. Gofman later became an antinuclear activist in the 1970s and 1980s, appearing at several reactor interventions to testify for the opposition.

The most noteworthy plant siting dispute of the first phase and the first contested nuclear power licensing case was the Fermi fast-breeder plant. In June 1956 the Advisory Committee on Reactor Safeguards (ACRS) had contradicted the AEC, characterizing it as the *most hazardous of all reactors*. Subsequently, the United Auto Workers (UAW) initiated the challenge of the experimental Fermi plant; and was later joined by the AFL-CIO, which intervened at AEC hearings on behalf of the people living in and around Detroit. When these efforts failed, the AFL-CIO took the case to the courts. Finally in 1961 the Supreme Court ruled that construction of the plant could commence, thereby deferring health and safety issues to the operating licensing stage (i.e., after construction was finished). The Fermi plant suffered a partial meltdown on 5 October 1966, and was decommissioned in the early 1970s without ever operating economically. That accident remained unknown to the general public until the 1975 publication of John Fuller's book *We Almost Lost Detroit*.(11) It is somewhat ironic that the first intervention was undertaken by a union, since particularly after 1966 when the industry was expanding rapidly, most labor unions allied themselves with the nuclear industry, primarily because construction of nuclear power plants employ a relatively large number of workers.

However, the United Mine Workers (UMW) was the only union to oppose nuclear power in general, because it directly threatened its livelihood. Coal miners understood that a shift by capital to nuclear technology would outflank and undercut their struggles. As early as the 1950s the UMW had raised concerns about the health effects of radiation, it had expelled members for publicly supporting nuclear power; and had actively campaigned against the extension of the Price-Anderson Act and the construction of the Clinch River Breeder reactor in Oak Ridge, Tennessee.

As we have seen, the fallout controversy had mobilized women across the country. Building on that base women began taking an interest in the low-level effects of radiation from nuclear plants on their own health and their children's health as well. For example, Mary Hayes Weik, a writer-activist, successfully intervened in the proposed Ravenswood reactor. And Rose Gaffney, a 76-year-old grandmother, waged a six-year court battle against Pacific Gas & Electric Co. The utility had tried to buy her land for the construction of the proposed Diablo Canyon reactor.(12)

3.1.3 Uranium Mining and Milling on Indian Reservations

With regards to the front end of the fuel cycle, it was the development of a nuclear weapons arsenal that fueled the first uranium boom in the 1950s both on and off the reservations. An estimated 55 to 65 percent of all U.S. uranium deposits are located on Indian reservations; 90 percent if treaty lands are included. However, the U.S. has refused to honor treaties signed in the last century. Moreover, half of all domestic uranium lies under the Dine (Navajo) land in the Grants uranium belt in northwestern New Mexico. In addition, western Indian reservations overlie one-third of all western sulfur coal and perhaps one-fifth of American oil deposits.(13) The general public knew relatively little about the contamination of reservation lands until native Americans linked with the antinuclear power movement in the mid- to late-1970s. In the last fifteen years, Indian reservations have become battlegrounds for energy multinationals, the State, and the native American Movement.

Although the minerals under the lands are extremely valuable, native Americans have been poorly paid for the use of their land and labor. For instance, native American miners were paid only \$1.60 per hour (two-thirds of the then prevailing off-reservation rates). And working conditions on reservation mines were much worse than those off the reservation. Those mines were poorly ventilated; workers were sent into the mines shortly after blasting before the dust had settled; and miners even ate inside the mines and drank contaminated water. It was only in 1972 that the Department of Labor (Walsh-Healey Act) began enforcing uranium standards in all mines as a result of pressure from uranium miners.

By the late 1960s many uranium mines had been abandoned because they had become unprofitable. Left behind were millions of tons of uranium tailings that will expose children and adults for eons. Radioactive tailings (a fine grey sand), which remain after most of the uranium has been extracted, release deadly radon gas that cause cancer, birth defects, and leukemia. Mill tailings retain 85 percent of the original radioactivity of uranium. In the first three decades of uranium mining alone, more than 90 million tons of radioactive tailings were piled up on Indian lands.(14) Wind and water erosion have spread the radioactivity far outside the original perimeter of the uranium mills; surface and ground water have already become polluted and will worsen through leaching and leakage of tailing ponds. Much devastation has already been wrought on the land and its people. For instance, at the Kerr-McGee uranium mine at Shiprock, New Mexico which operated between 1954 and 1969, the abandoned radioactive mine and mill plus 71 acres of radioactive mill tailings will continue to endanger the people of Shiprock. By 1980, 38 of the roughly 150 miners who worked in that poorly ventilated mine had died of radiation induced cancer and another 95 had contracted respiratory ailments and cancer.(15)

3.2 The Second Phase of the Struggles: 1968 to 1976

The second phase of the cycle was achieved when those who were opposed to nuclear power linked with environmentalists in the late 1960s. Between 1968 and 1972 the environmental movement reached a high degree of intensity, changing the way we think about nature and technology. People came to believe that the domination of nature had gone too far, threatening life on the planet. While in the past, technology had been viewed as progressive, now some technologies were viewed as the source of our problems, e.g., complex technologies like nuclear power that are destructive of nature. Hence, in 1970 Friends of the Earth was the first national environmental organization to take a critical position on nuclear power. Through its journal *Not Man Apart* and its book publications it helped to circulate antinuclear struggles worldwide. Before discussing the environmental effects of nuclear power and the ensuing struggles, I will show how the environmental movement also had its roots in the test-ban movement.

It is generally acknowledged that Rachel Carson's *Silent Spring* launched the environmental movement of the 1960s.(16) Carson questioned the irresponsibility of an industrialized technological society toward the natural world. In his reading of Carson's *Silent Spring*, Ralph Lutts explored the connections between fallout and pesticides. According to Lutts, the reason that the book had such a major impact was the fact that the radioactive fallout controversy had played a special role in preparing the public for Carson's message.(17) *Silent Spring* was published (27 September 1962) one month before the Cuban missile crisis and one year before the signing of the Limited Test Ban Treaty.

By 1962 the debate over radioactive fallout had been raging for a decade. Lutts believed that environmental and health hazards were on Carson's mind when she wrote the book. He cited the following evidence: In the new preface to the revised edition of *The Sea Around Us* (1960), Carson expressed her fears about the growing use of oceans as radioactive dumps.(18) The first pollutant mentioned by name in *Silent Spring* was strontium 90, not DDT; she immediately followed it up with chemical pesticide spraying. Lutts states that "Sr-90 was a tool to help [Carson], explain pesticides."(19) In "A Fable for Tomorrow," the opening chapter of *Silent Spring*, Carson conjures up the specter of radioactive fallout: A white powder "had fallen like snow upon the roofs and the lawns, the fields and streams," which had brought on Silent Spring. Elsewhere she compares the death of a Swedish farmer by pesticide poisoning to the radioman of the Japanese fishing vessel, the Lucky Dragon who had died of radiation poisoning from American nuclear testing.(20) In the following passage Carson makes an explicit connection between nuclear power and pesticides.

Along with the possibility of the extinction of mankind by nuclear war, the central problem of our age has therefore become the contamination of man's total environment with such substances of incredible

potential for harm—substances that accumulate in the tissues of plants and animals and even penetrate the germ cells to shatter or alter the very material of heredity . . .

[m]any chemicals, like radiation, bring about gene mutations.(21)

Similarly, Barry Commoner first learned about environmental problems when he became concerned about the consequences of fallout.(22)

3.2.1 The Environment and Nuclear Power

The 1946 and 1954 Atomic Energy Acts had limited the AEC to strictly *public safety* concerns. But in the late 1960s a controversy arose over the release of relatively large amounts of heat into rivers, lakes, and oceans by reactors, i.e. thermal pollution, which endangers aquatic life that is sensitive to temperature variations. That controversy resulted in the enactment of the National Environmental Policy Act (NEPA) in 1969, which greatly expanded the AEC's responsibilities. Except for perhaps the Fermi I case, reactor-siting decisions in this country had been until the passage of NEPA technical exercises. Environmentalists successfully used the new law for the first time in the case of the proposed Calvert Cliffs twin reactors at Cayuga Lake, which planned to discharge water into the lake. The federal court ruling of 23 July 1971 required all utilities to provide environmental impact statements before the AEC would issue a construction permit for any nuclear plant. The Calvert Cliff decision produced a body of case law that paved the way for legal intervention in AEC licensing hearings for new plants.(23) Thus, it was environmental groups that spearheaded the movement toward a full-scale, sophisticated intervention in AEC licensing proceedings.

3.2.2 Intervention

The environmental movement did not halt the nuclear program, but it did manage to slow it down. Legal intervention caused lengthy delays in construction; however, it is not clear that these delays actually caused nuclear plant costs to rise. As we will see in chapter 4, other factors such as new regulations affecting reactor design, the result of antinuclear pressure, and construction mismanagement were more critical in increasing costs. Overnight environmental public interest law firms sprang up, e.g., the National Resources Defense Council, the Sierra Club Legal Defense Fund, and the Environmental Defense Fund, which had as their main clients the national environmental groups, such as the Sierra Club, the National Audubon Society, Friends of the Earth, and the Wilderness Society. Environmentalists of this period operated strictly within the system, lobbying Congress, intervening in AEC hearings and court cases, and educating the public.

Many of those interventions in AEC-NRC hearings and in the courtrooms were undertaken by women. Mainstream women's magazines, such as *Redbook* and the *Ladies Home Journal* had begun reporting on the health effects of nuclear power in the early 1970s.(24) I cite only a few examples of interventions undertaken by women. June Allen, a Virginia music teacher, found that Virginia Electric Power and Co. had built its North Anna plant over a geologic fault. Dolly Weinholt spent years doing research on earthquakes and nuclear power plant design; she informed Seabrook owners that the plant lies on an earthquake fault.(25) In Oklahoma Carrie Dickerson helped found Citizens Action for Safe Energy (CASE), which intervened before the NRC and state agencies. CASE was ultimately successful in forcing Oklahoma Public Service to abandon the Black Fox Nuclear Project.(26)

The AEC became embroiled in a second controversy over the Emergency Core Cooling System (ECCS). By 1971, intense pressure from the antinuclear movement forced the AEC to open the longest rulemaking hearing in its history, lasting 18 months. The Union of Concerned Scientists (UCS) argued that ECCS was inadequate and would not function properly to avert a major catastrophe. Since ECCS was a generic problem, people all over the country became interested in the hearings. Before ECCS, antinuclear opposition had been directed against particular power plant projects, now a case was being made against the technology itself.(27)

3.2.3 Energy Push on Reservation Lands

As early as 1972, the Nixon administration and the Trilateral Commission had drawn up plans designating the Four Corners region (at the junction of New Mexico, Arizona, Utah, and Colorado) and the Black Hills region (parts of the Dakotas, Wyoming and Montana) as *National Sacrifice Areas*. Both the State and the nuclear industry at this time were attempting a massive expansion of nuclear power, which would render uninhabitable large land

areas, creating wastelands through the deliberate elimination of water supplies.(28) In the process, a marginal group, native Americans, would be sacrificed along with their land to obtain the uranium needed for the thousand reactors that had been envisioned. That attempt failed, however, those plans can always be revived should the nuclear industry make a comeback.

Nonetheless, the second uranium boom fueled by the expansion of the nuclear industry between 1965 and 1974, resulted in a significant loss of control of Indian lands to oil companies. In addition, the 1973 oil crisis helped to make uranium mining profitable again; energy companies began swarming over federal and Indian land. Already, oil companies have managed to obtain leases to 76 percent of all uranium reserves.(29) The oil companies have been aided by the Bureau of Indian Affairs (BIA), which has cited the national energy shortage as its prime consideration in approving mining leases. In its haste to lease Indian lands, BIA has failed to prepare environmental impact statements, solicit the opinion of local Indians, monitor uranium leases, or enforce environmental safety. Tribal councils such as the Council of Energy Resource Tribes (CERT), which had been elected by only a small percentage of Indians, have become corrupt and tyrannical, and do the bidding of BIA. An elite group of Indians has managed to accrue some wealth as a result of the uranium boom, leaving the majority of Indians destitute.(30)

3.2.4 The Emergence of a Distinct Antinuclear Power Movement

While the intervention process was successful in imposing safety requirements on the nuclear industry, it did *not* halt the construction and licensing of reactors. Intervention proved to be too expensive, too technical, and confined to hearing rooms and courtrooms, largely removed from public attention. By 1974 a new strategy was required. Under the sponsorship of Ralph Nader, the *Critical Mass '74* conference held in Washington, D.C. brought together citizen activists from all over the country. Instead of battling the AEC, activists took the issue directly to the public, presenting it in terms the public could understand. Critical Mass the organization was formed after the 1975 conference to coordinate the activities of local citizens' groups; however, the autonomous, grassroots antinuclear movement would not accept Nader as its leader, nor anyone else for that matter.(31)

Another tactic widely used in this phase was the antinuclear referendum. The most hotly contested referendum was the June 1976 California *Nuclear Safeguards Initiative* (called for a moratorium on nuclear power construction in the state) which went down to defeat by a two to one margin. The antinuclear movement was not only outspent by the nuclear industry, but was also outmaneuvered. Utility companies used the *job blackmail* issue to obtain labor support. It was able to persuade the public that a vote for any of the antinuclear initiatives was a vote against jobs.(32) More widely in the 1976 general election, state referenda which sought to control nuclear expansion were defeated in Oregon, Washington, Colorado, Montana, Arizona, and Ohio. In 1978 voters in Hawaii and Montana passed limited antinuclear referenda and in Missouri, Construction Work In Progress (CWIP) was voted down.(33) Local referenda on proposed reactors outside Seattle and in conservative Kern County, California were also defeated.

By the mid-1970s opposition to nuclear power had taken its toll on the AEC. Public discontent with the AEC had dated back to 1956 when the AEC had rejected the opinion of the Advisory Committee on Reactor Safeguards on Fermi I and had also ignored labor opposition to the plant. The AEC had managed to anger various groups, e.g., antinuclear activists, environmentalists, scientists, even Congress. Finally, the ECCS hearings which exposed a nuclear industry-government cover-up pitched the AEC into crisis. Consequently, the AEC's regulatory and promotional duties were separated—i.e., the Nuclear Regulatory Commission would be solely responsible for regulation, and the Energy Research and Development Administration (ERDA) would study and promote nuclear power and, in theory at least, other alternative energy technologies. Although the NRC has stiffened safety, health, and design standards due to intense pressure, it has continued to have close ties with the industry and has been reluctant to come down too hard on the industry, for fear of smothering it. ERDA was later subsumed into the Department of Energy (DOE) in 1978. Under ERDA and later DOE, nuclear power continued to be the largest recipient of research and development funding. On the other hand, the Joint Committee on Atomic Energy was not abolished until 1977; its powers were distributed among some twenty congressional committees. Finally, after years of intense pressure, the fundamental contradiction between regulation and promotion which had plagued the AEC was resolved and the extraordinary powers of the JCAE were taken away. Nonetheless, the forced reorganization of the AEC in 1975 was mostly cosmetic rather than substantive, and was used by the AEC to regain its credibility.(34)

3.2.4.1 Entrance of the Women's and Labor Movement into the Antinuclear Movement

The November 1974 death of Karen Silkwood, a worker and labor activist at the Kerr-McGee Cimarron plant in Oklahoma, rallied the antinuclear movement. It brought two previously uninvolved groups into the movement, the National Organization of Women (NOW) and the Oil, Chemical, and Atomic Workers (OCAW). Before her mysterious death in a car accident, Karen had been documenting the exposure to workers of excessive levels of plutonium at the Kerr-McGee fuel fabrication plant. In an attempt to discredit Karen, Kerr-McGee may have purposively contaminated her with plutonium.(35) Both the NOW labor committee and Supporters of Silkwood (composed mainly of women and unionists), conducted independent investigations into the circumstances of her death, and they also filed a suit on behalf of the children of Karen Silkwood. NOW commemorated her death by designating 13 November 1978 Karen Silkwood day, which continued to be observed into the 1980s. Silkwood's death also focused attention on the working conditions of nuclear workers. In a four-year period, 73 workers had been contaminated with plutonium at the Cimarron plant; it was subsequently closed in 1975.(36)

In the mid-70s various attempts were made to link labor with environmentalists, who shared common concerns, but who in the past had been at odds. One of the first efforts was the 1975 Urban Environment Conference sponsored by a group of labor, environmental, and civil rights organizations. Antinuclear speakers were invited to discuss the job impact of nuclear power. Additionally in 1975 Environmentalists for Full Employment (EFFE) was formed, which consciously sought to bring labor into the antinuclear camp. EFFE published *Jobs and Energy* in 1977, which examined the job creation potential of soft energy. And in 1976 at the conference on Environmental and Economic Justice, Leonard Woodcock, president of the UAW at the time, called for a labor-environmental coalition. A somewhat fragile coalition was built in this phase; however, it would take the accident at Three Mile Island to spur some sectors of labor to join the antinuclear cause.(37)

3.3 The Third Phase of the Struggles: 1977 to 1988

By mid-1976 segments of the antinuclear movement had become frustrated with the tactics of legal intervention and voter referenda. The Clamshell Alliance, which opposed the Seabrook reactor in New Hampshire, adopted the tactics of civil disobedience and direct action, thus moving to a higher terrain of class struggle. Not everyone in this phase engaged in civil disobedience and direct action, but regardless of the tactics employed, struggles circulated rapidly—geographically and to other sectors of the class. A powerful, autonomous, grassroots network had emerged. In this phase public opinion against nuclear power grew from an insignificant minority before the Seabrook occupations to a majority position after the TMI accident, and to an even larger majority after the Chernobyl accident.

The antinuclear power movement peaked in the late 1970s as antinuclear actions declined in intensity and number. However, the issue did not fade; activists continued to protest against plants that were nearing completion and awaiting operating licenses, e.g., Shoreham, Seabrook, the South Texas Nuclear Project, and Comanche Peak. Moreover, the accident at Chernobyl helped to revive the grassroots movement. Other issues surfaced such as emergency evacuation plans, the siting of a high level waste dump, and the deteriorating conditions of nuclear weapons plants.

3.3.1 Direct Action-Civil Disobedience

The most embattled reactor by far has been Seabrook. Prior to the issuance of the Seabrook plant construction permit in 1976, Seabrook residents had opposed the reactor at regulatory agencies and at a town meeting vote. Spurred by the failure of those methods and inspired by the success at Whyl, West Germany in 1975, nuclear opponents from New Hampshire and other parts of New England formed the Clamshell Alliance.(38) The occupation of the Whyl reactor site had attracted 200,000 protesters from all over Europe, resulting in the subsequent cancellation of the project. The Whyl protest had also received strong support from the local farming population. In August 1976 eighteen members of the Clamshell Alliance participated in the first Seabrook occupation. The Clamshell went back two weeks later for a second occupation. The following year on 30 April 1977 they returned with 2500 demonstrators to illegally occupy the construction site of the Seabrook nuclear power plant. The Clams had intended to occupy the construction site until work on the plant was stopped. But on the next day, after being asked by the state police to leave, 1,414 protesters were arrested for criminal trespass. The

publicity generated by their act of mass civil disobedience and their two week detention in state armories circulated the antinuclear struggles nationwide. One year later on 8 June 1978, 10,000 attended a rally at Seabrook.(39)

The Clamshell Alliance inspired the formation of similar direct action groups and alliances across the country such as the Abalone Alliance in California, the Catfish Alliance in 10 southern states, the Oystershell Alliance in Louisiana, the Crabshell Alliance in Washington state, the Sunflower Alliance in Kansas, and the Palmetto Alliance in South Carolina. The Seabrook occupations also inspired the creation of the Mobilization for Survival (MOBE) in 1978 to link the forces of disarmament with antinuclear groups. The two groups shared common interests, such as the disposal of radioactive waste—a problem encountered in both military programs and nuclear power production—and plutonium, a byproduct of nuclear power reactors which can be used to make weapons. In Texas the Mobilization for Survival was a major participant in the protests against Comanche Peak and the South Texas Nuclear Project.(40)

The Abalone Alliance protest against both the Diablo Canyon reactors in San Luis Obispo, California and the Livermore Laboratory where nuclear weapons research takes place, was as important in the West as the Clamshell was in the East. The struggle at Diablo Canyon dated back to the 1960s. It began with the proposed Bodega Bay plant, which the Sierra Club opposed for environmental reasons. Shortly thereafter, the California utility made a quick deal with the Sierra Club, agreeing to stop construction at Bodega Bay (a large trench had already been dug) if the Sierra Club would approve the new site at Diablo Canyon. Several years later antinuclear activists learned that Diablo Canyon rested on an earthquake fault. The Diablo Canyon reactor was the site of many demonstrations and occupations, some of which attracted thousands of protesters.

The accident at Three Mile Island of 28 March 1979 combined with long-time pressure from the antinuclear movement frustrated the expansionist dreams of the nuclear industry. The type of accident that occurred at TMI was not supposed to happen according to the industry and the AEC. By denying that such an accident could happen, they created their own downfall. An already financially beleaguered industry could not withstand the fallout of TMI—i.e., public confidence in nuclear power was destroyed. In 1979 and 1980 hundreds of rallies and demonstrations took place: On 6 May 1979 an estimated 65,000 people gathered in Washington, D.C. to protest against nuclear power and a State which would not relinquish its nuclear energy policy. Protests also took place in Harrisburg, at Diablo Canyon, the Rocky Flats plutonium plant, on Wall Street, at Matagorda in Texas, at the Department of Energy, and many other places. TMI frightened investors away and resulted in the cancellation or postponement of a large number of reactors. In the post-TMI era, the Nuclear Regulatory Commission finally capitulated to pressures and began to regulate the industry. It issued a whole spate of safety design requirements that subsequently increased the costs of nuclear reactors. Sectors of the class brought in by the TMI accident were the Gray Panthers, young mothers, farmers, and professionals, college students, traditional women's groups, and feminist safe-energy groups.

After TMI nuclear critics from within corporations, co-ops, and municipal utilities began pressuring management to end investment in nuclear power. For example, in 1980 a proposal by some General Electric stockholders requesting that GE withdraw from nuclear power and nuclear weapons catalyzed the formation of the GE Stockholders' Alliance Against Nuclear Power.(41) In western Massachusetts, a consortium of 30 municipal utilities reduced its promised investment in Seabrook by 60 percent following a citizens' campaign. And the members of a New Hampshire utility co-op forced Public Service of New Hampshire to buy back its 2 percent Seabrook share.(42) In addition, antinuclear and consumer groups have been pressuring public utility commissions to end investment in nuclear power. For example, the Vermont Public Service Board's 1979 ruling that stockholders, not customers, were responsible for investment failures caused two utilities to drop their promised investments in the Seabrook reactor. Several state PUCs have also disallowed millions of dollars in nuclear capital costs.(43)

The TMI accident was another rallying point for women. Mainstream women's organizations such as NOW, YWCA, and the National League of Women's voters reassessed their positions on nuclear power. In May 1979 the YWCA made a complete switch in its thinking, deciding that its commitment to environmental protection, safety, and peace made it incumbent upon it to oppose further construction of nuclear power plants until adequate safety precautions were implemented and until the nuclear waste disposal problem was solved.(44) The National League of Women Voters called for a six-month moratorium on the issuance of construction permits for nuclear reactors.(45) More importantly, the TMI accident spurred several women to organize the "Women and Life on

Earth: Ecofeminism in the '80s" conference in the Spring of 1980, which addressed ecological issues from a feminist perspective and which was important to the development of the ecofeminist movement.(46)

Grace Paley renewed her antinuclear activism in the 1970s. She was one of the White House Lawn 11 who on Labor Day of 1978 unfurled a banner that read "No Nuclear Weapons—No Nuclear Power—USA and USSR." In Moscow's Red Square 7, the Americans unfurled an identical banner coinciding with the American action. Paley and the others were found guilty of unlawful entry, fined \$100, given a suspended sentence of 180 days, and put on probation for three years. Singer Holly Near's activism also dates back to the antiwar movement. On her concert tours she has emphasized the connections between all kinds of oppression, such as nuclear power's rule by elites, militarism, racism, sexism, homophobia, classism, and discrimination against the physically handicapped. Like Helen Caldicott, she believes that women will lead the change in the nuclear mentality. During the last 10 years, she has been closely identified with the antinuclear movement. Her Fall 1979 tour, "Holly Near—On Tour for a Nuclear Free Future," raised money for women's cultural organizations and grassroots organizations, working against nuclear power and weapons.

Three Mile Island also spurred the formation of many feminist safe-energy groups such as Lesbians United in Non-nuclear Action (LUNA) in Boston, Dykes Opposed to Nuclear Technology (DONT) and Women Opposed to Nuclear Technology (WONT) in New York, Women Against Nuclear Development (WAND), in the upper valley of Vermont and New Hampshire, and Women's Pentagon Action North and South. WAND women had been previously affiliated with the Clamshell Alliance but preferred to organize their own women's group. They produced the *Handbook for Women on the Nuclear Mentality*, which critiqued nuclear power from a feminist perspective.(47)

WONT and LUNA were part of approximately 25 autonomous antinuclear groups that made up the Northeast Womyn's Alliance Against Nuclear Power and Destruction. On 3 May 1980 the Northeast Womyn's Alliance gathered 300 women in Hartford, Connecticut, to protest against United Technologies, a multinational corporation involved in arms production. Its next action was the 24 May 1980 occupation-blockage of the Seabrook plant. Alliance members who participated in that action formed their own cluster of affinity groups, calling themselves the Lesbian Tide, that maintained its own autonomy and living space at the Seabrook occupation.(48) The intent of these feminist groups was to create spaces for themselves, thus bypassing the male-dominated groups. The decentralized structure of the antinuclear alliances allowed women to work with other women within affinity groups, thus minimizing contact with the larger male-dominated structures.

While some women in the antinuclear movement advocated separatism to empower themselves, Women of all Red Nations (WARN) did not want to separate from the men or to take a women's liberation approach. WARN was founded in September 1978 "to bring back the traditional role of women in the Indian nations and in the leadership of AIM."(49) In the Black Hills of South Dakota, WARN has joined forces with the Black Hills Alliance to end uranium mining in the region.

In this phase the antinuclear movement linked with the native American movement, which had become concerned with the impact of uranium mining on its lands and its way of life, threatening tribal survival. The first uranium boom had turned Indian lands into radioactive pits, while the financial gains were short-term, while the health effects were long-term. By 1983 the Navajo nation was home to 52 uranium mines and 10 uranium mills. The late 1960s witnessed a resurgence of Indian nationalism, which correlated with other liberation struggles such as Chicana(o)s Puerto Rican, and black struggles. In 1968 the American Indian Movement (AIM) came into existence, playing an important role both on and off the reservations in the 1970s. AIM was not only anti-imperialist, but also antinuclear. For example, in August 1978 AIM organized the National No Nuclear Strategy Conference in Kentucky.

Uranium contamination is a fact of life for Indian communities in the Grants Mineral Belt of the southwest, the southern Black Hills, eastern Washington state, and the Snake River aquifer region. A tentative study conducted by WARN in late 1979 at the Pine Ridge Sioux Reservation showed that contaminated ground waters feed the reservation. Mining operations in the area date back to 1951. In a one-month period, 38 percent of all the pregnant women on the reservation miscarried. Genetic defects such as club foot and cleft palate among newborns were also on the increase.(50)

On 16 July 1979 one of the largest radioactive waste spills in the country occurred on Navajo land at Church Rock, New Mexico. One hundred million gallons of radioactive water and more than one thousand tons of contaminated debris spilled from the United Nuclear Corporation's waste storage lagoon into the Rio Puerco, serving the towns of Gallup, Lupton, and Sanders as well as a large section of the Navajo nation. Navajos had to truck in water and could not eat or slaughter their own contaminated livestock. According to *Critical Mass Journal* some Indians believe that the radioactive contamination at Church Rock was more serious than that which had occurred at Three Mile Island. The accident went largely unreported outside the area. According to the New Mexico Environmental Improvement Division 80,000 gallons per day of contaminated liquids were seeping into the groundwater two years after the spill.(51)

In New Mexico (the largest uranium producer-state) a new coalition of Indians, whites, and Chicana(o)s has emerged. On 28 and 29 April 1979 at Gulf Oil's uranium mine on Mount Taylor in northwestern, New Mexico, a demonstration organized by the American Indian Environmental Council attracted 500 Indians, Chicana(o)s, and whites, who were demanding a halt to uranium mining and the shutdown of the nuclear power industry.(52) Native Americans and whites also joined forces against the multinational conglomerates in 1979, forming the Black Hills Alliance (BHA) of South Dakota to counter the second uranium boom. BHA is a coalition of native Americans, Indian activists, white ranchers and farmers, militant miners, antinuclear activists, and environmentalists.(53) In the summer of 1980 and 1981, the BHA and the Sioux Nation hosted the National Gathering of the People and the International Gathering respectively. Their objectives were the development of strategies and tactics for the antinuclear and anti-imperialist movement, which they see as complementary.(54)

Shortly after the Chernobyl disaster the Columbia River Inter-Tribal Fish Commission called for the closing of the N Reactor at the Hartford Nuclear Reservation. The N Reactor resembles the Chernobyl reactor in the Soviet Union, in that it uses graphite to help control the flow of neutrons that sustain the chain reaction. All of the member tribes' reservations are located within 150 miles of the Hanford N Reactor, with the Yakima Indian nation's reservation adjoining the Hanford reservation.(55) The N reactor was eventually shutdown in December 1986 for safety reasons. It is rumored that the plant will never reopen because it has shown dangerous signs of aging.(56)

Furthermore, the antinuclear movement spawned a political party—the Citizen's Party. Barry Commoner, a longtime antinuclear activist, was its presidential candidate in 1980.(57) The Citizens' party was the only political party with strong antinuclear, alternative energy, minority, and feminist planks. It suffered a disastrous loss in the 1980 elections, however, it did win a few surprising victories at the local and state level. Even the autonomous antinuclear movement remained aloof from the party.(58) There have also been efforts to create a Green movement (e.g., The Lone Star Greens) in the United States patterned after the West German Greens. In West Germany the emergence of the Greens was a direct result of the antinuclear movement, beginning with the site occupation of a proposed nuclear power plant at Wyhl, West Germany in 1975, followed by confrontations at Brokdorf, a planned nuclear site north of Hamburg and at the Grohnde nuclear site in Lower Saxony.(59)

Although officially labor had entered the antinuclear movement in the second phase (isolated cases), it wasn't until the third phase that a small but significant sector of labor joined the antinuclear camp. Before TMI only a handful of unions such as the United Mine Workers, the Graphics Arts International Union, and the International Longshoremen's and Warehousemen's Union had opposed nuclear power. And by late 1978 William Winpisinger, president of the International Aerospace and Machinists had also publicly taken an antinuclear position. A few locals of the steelworkers and meatcutters actively supported the movement against nuclear power. The November 1978 Joint Economic Hearings on "Creating Jobs Through Energy Policy" had helped to expand the dialogue on energy and jobs within the labor movement. In April 1978 Winpisinger, IAM president, helped to form the Citizens/Labor Energy Coalition, which took a cautious position, supporting solar energy and conservation without mentioning nuclear power to avoid alienating pronuclear unions.

The erosion of labor's support for nuclear power accelerated after the meltdown at TMI in 1979. Although the AFL-CIO's platform was still pronuclear, after TMI it contained a qualification: "The nation must never relax stringent health and safety regulations governing nuclear power."(60) A flurry of antinuclear resolutions were passed by locals and districts of the UAW, the Steelworkers and the American Federation of State, County and Municipal Employees (AFSCME). Four international unions took antinuclear positions, i.e., the Machinists (July 1979), the International Chemical Workers Union (November 1979), the International Woodworkers of America (October 1979) and the Communications Workers of America (June 1980). Some believe that Mazzochi's close

connection with the Silkwood case as well as his antinuclear stance brought him in conflict with the management of the nuclear industry and undoubtedly contributed to his defeat of the presidency of the OCAW in August 1979.(61) The direct action group, the Clamshell Alliance had an active labor committee which educated antinuclear activists about labor concerns and which convinced others in the Alliance to help publicize the J. P. Stevens boycott and raise funds for the UMW during the winter 1977-1978 coal strike.

The largest ever *labor-organized* nuclear protest took place on 28 March 1981 in Harrisburg, which commemorated the second anniversary of the TMI accident. The protest included a march sponsored by 12 international unions which attracted 15,000 protesters, who demanded that radioactive water from the crippled plant not be dumped into the Susquehanna River and that the undamaged Unit 1 remain permanently closed. To counter the impact of the demonstration, the building and construction trades department of the AFL-CIO bought full-page ads in the *Harrisburg Patriot* and the *Washington Post*, which denounced the march and denied that the involvement of 12 international unions indicated organized labor's support for nuclear power was weakening.(62)

An example of what a unified labor movement and the antinuclear movement can accomplish is the case of Steelworkers Local 1010 (the largest steel-making local in the nation representing 18,000 workers at the Inland Steel plant in East Chicago). Building on a history of health, safety, and environmental activism, Local 1010 became involved in a campaign against the construction of the Bailly nuclear plant that was to be built next to the Indiana Dunes National Lakeshore Park, six miles from Gary. The local focused its campaign on showing that the Bailly nuclear plant was not necessary for jobs and that a coal-fired plant, energy conservation, and solar power were viable alternatives. Together with the antinuclear Bailly Alliance Local 1010 went to the workers at the Bethlehem Steel plant, adjacent to the Bailly site, and informed them of the company's plans to have 170 workers remain on the job in the event of a reactor accident in order to save the company's costly coke ovens and blast furnaces.

After the TMI accident Bethlehem Steel workers joined the anti-Bailly forces. Local 1010 even went to the workers at the Northern Indiana Public Service Co. (NIPSCO) to obtain their support in opposing the plant their employer wanted to build. In April 1981 when the NRC gave NIPSCO authorization to resume construction of the Bailly plant, over 1000 local workers and their families demonstrated their disapproval. Unified opposition from both workers and antinuclear groups forced NIPSCO to abandon the Bailly plant. This successful cooperation between the union local and the antinuclear movement was, due at least in part, to the fact that Inland Steel's East Chicago plant is both modern and profitable, which made the workers less susceptible to job blackmail.(63)

Opposition to nuclear power has come from outside the nuclear plants, not inside, although there have been a few exceptions. Such as the sixteen hundred nuclear workers who went on strike in 1979 over economic, health and safety issues at the Portsmouth Gaseous Diffusion Plant in Piketon, Ohio, a uranium enrichment plant owned by DOE but operated on a cost-plus basis by Goodyear Atomic. When this occurred a coalition of seven national environmental organizations provided support to the striking workers, which included SANE, the Urban Environment Conference, Environmentalists for Full Employment, Environmental Policy Center, Environmental Action Foundation, Mobilization for Survival, and Friends of the Earth. They generated publicity for the strikers' cause and put political pressure on DOE. The workers finally won primarily because of DOE pressure on Goodyear Atomic. At Portsmouth, environmentalists avoided the sensitive issue of nuclear power development and instead adhered to health and safety issues inside the plant and the importance of strong unions.(64) Furthermore, in 1988 at the Frenald plant in Ohio (one of the worst managed weapons plant), workers went on strike complaining about unsafe working conditions.(65)

The Chernobyl accident in May 1986 strengthened the antinuclear movement worldwide, because for the first time a nuclear accident resulted in political conflict between countries, because borders are not effective barriers of radiation contamination. In the United States, prior to the Chernobyl accident, 67 percent of the American people had opposed the building of additional nuclear power plants, but after Chernobyl that percentage grew to 78.(66) U.S. antinuclear struggles were revived by the Chernobyl accident, particularly at Shoreham and Seabrook. *Chernobyl* also strengthened the movement in Scandinavia and West Germany, which had been significantly affected by radiation fallout from the Chernobyl explosion.(67) "In West Germany the public received its information through extensive independent groups—products of the long-standing antinuclear movement—rather than official sources."(68) In areas that were directly affected by the Chernobyl accident, people lost faith in their government. In England independent monitoring groups have been set up to measure radiation levels. In New England in 1986 the government announced that Maine and New Hampshire had been

chosen as finalists for a high level nuclear waste dump. Eventually DOE had to back off because of the intensity of antinuclear sentiment in the area.

Finally, in 1988 the movement appeared to have won two major battles at Seabrook and Shoreham—both plants were on the brink of financial disaster. However, in 1989 both Seabrook and Shoreham were given operating licenses as a result of Reagan's 1988 Executive order. A battle is brewing between the states of New York and Massachusetts whose governors have vowed that the plants will never open and, on the other hand, the federal government which is determined to revive the nuclear industry.

3.3.2 Pronuclear Union Leadership

Of all the coalitions established by the antinuclear movement in the last 40 years, the labor-antinuclear power coalition has been the most difficult to forge. A common link exists between the movement and labor, i.e., working conditions in the nuclear plants. But as mentioned earlier it is impossible to organize from inside the plants. On the other hand, a common link also exists between labor and the nuclear industry, i.e., the large number of jobs created during the construction phase of a nuclear project. In hard economic times they may be too difficult to pass up, particularly in certain small communities, which have become the preferred places for the building of nuclear plants, because opposition is usually nonexistent (e.g., Comanche Peak near Glen Rose, Texas and South Texas Nuclear Project, Matagorda, Texas).

In the late 1970s and 1980s, labor union leaders continued to support nuclear power despite the industry's antilabor activity. Reminiscent of the Vietnam era, 3,000 pronuclear construction and utility workers in 1977 took to the streets of Manchester, New Hampshire only weeks after nuclear opponents had occupied the Seabrook reactor site. Public Service of New Hampshire part owner of Seabrook contributed money and buses for the counterdemonstration.(69) In Texas under pressure from the building trades the AFL-CIO helped defeat the Austin referendum on nuclear power in 1979. It continued to push for the finishing of the South Texas Nuclear Project even after the Chernobyl accident in 1986 and STNP's pathetic construction record.(70)

The most pronuclear sector of labor has been the building and trades sector because the income derived from nuclear plant construction has been substantial: Labor costs on nuclear plants represent between 35 to 40 percent of total costs, on a coal-fired plant they represent 25 percent. With a total nuclear construction bill much higher than that of a coal-fired plant, total labor costs are even higher. For example, in 1979 the average 1000 megawatt reactor paid out \$400 million in wages alone.

The nuclear industry too has had a long history of antilabor and anti-union activity. When it suits their political purposes, they build reactors with union labor. When it doesn't, as in the four power plants in Texas, they use nonunion labor. Such anti-union behavior has sent mainstream Texas unions into the antinuclear camp. In the mid-1970s contractors began doing business with *open shop* construction firms in an effort to circumvent high labor costs.(71) Even the solidly pronuclear building trades union came under attack by the nuclear industry. In 1978 sixteen major building trades unions under pressure from four national union contractors (e.g., Bechtel, Stone and Webster, Ebasco Services, and United Engineers and Constructors) signed the "Nuclear Power Construction Stabilization Agreement," which included no-strike clauses aimed at speeding the construction of nuclear plants.(72)

Given the industry's antilabor activity, opportunities exist for a strengthening of the labor-antinuclear coalition. Nevertheless, the process may be slow, because labor is unwilling to give up high paying nuclear construction jobs and because many people both inside and outside labor believe that there exists a direct relationship between the rate of growth of energy consumption and the rate of growth of GNP, which prior to 1973 appeared to remain constant. By working towards decentralized energy technologies the movement can attract greater labor support in the future. The movement could also opt to work closer with women in the labor movement, because more women oppose nuclear power than men.

3.3.3 The Soft Energy Path

In addition, the antinuclear movement has been influenced by the alternative energy movement. Although the idea of alternative energy had surfaced with the return to the land movement of the late 1960s, it was Amory

Lovins' article in the conservative journal *Foreign Affairs*, which redefined the energy debate in terms of a *hard path* (especially away from nuclear) versus a *soft path* (especially dispersed solar).(73) Lovins questioned the validity of centralized high technology energy systems, which deplete nonrenewable resources, degrade the environment, eliminate jobs, squander capital, disrupt communities, and subject us to rule by *elitist technocracy*. He set off perhaps one of the most intense debates of the last 15 years. By 1980 a Gallup poll revealed that respondents ranked solar energy first and nuclear power last.(74) Lovins' soft energy path concept not only shook up the business elite and the State, but more importantly motivated people inside and outside the antinuclear movement to do something about their dependence on centralized energy systems. According to Harvey Wasserman a founding member of the Clamshell Alliance, Lovins' article dramatically changed the movement against nuclear power. Since it was printed just after the first two occupations at Seabrook, Lovins' thesis offered the antinuclear movement an alternative.(75)

In particular, the hard path refers to centralized, capital intensive energy grids, typical of central electricity generating plants whether coal, water, oil or nuclear power. The soft path refers to decentralized, often more labor intensive ways of organizing the production and distribution of energy. For example, solar energy advocates envision a situation in which virtually all the energy needs of each home or building complex can be generated on site, partly by decreasing needs via passive solar architecture, and partly by using a variety of sources such as solar, biomass, wind, and others. Soft-energy technologies can also be optimally matched in scale and quality to end-use needs, much more so than hard-energy technologies.

Furthermore, Lovins argues that the two paths are mutually exclusive because of the capital requirements that a hard path entails. Believing that it was in the best interest of capital to pursue a soft strategy, Lovins was trying to sell his ideas to the elite. Using orthodox arguments, he built a case against nuclear power. Lovins does not believe that profound social changes in society are needed in order to make the transition to solar energy. Today, Lovins and his Rocky Mountain Institute charge \$5000 a day plus expenses to utilities and state public utility commissions for consultation.(76)

Despite that Lovins does not question the free market system, his thesis still managed to challenge energy policy to its core. The virtues of solar, i.e., more democracy, greater autonomy, community control, and more self-valorization, also show the dangers to business of a loss of control. With energy being generated at the level of the home, the neighborhood, and workplace, there is no need for centralized power. Capital would lose control of its most important sector, since every coffee shop, every apartment, every sweatshop is plugged into a centralized energy grid. Capital could no longer extract surplus value from every *pore* of the social fabric.(77)

Sun Day, 3 May 1978 was the high point of the soft energy movement. Twenty-five million Americans participated in Sun Day activities, which made front page news in every major American newspaper.(78) Sun Day was organized by the same leaders and organizations associated with Earth Day and the early environmental movement. Denis Hayes helped organize both the Earth Day and Sun Day celebrations; Friends of the Earth (FOE) was the publisher of the official book of Sun Day, *Sun: A Handbook for the Solar Decade*. FOE concentrated its research on soft-energy alternatives, aided by Amory Lovins who in the 1970s had been the British Friends of the Earth representative. Many solar organizations were established at all levels.

For example, the Solar Energy Research Institute (SERI) was set up by the federal government and for a time was headed by Denis Hayes. It lost its funding under the Reagan administration, which slashed solar energy research, transferring funds to DOE's weapons program. Solar Lobby, which during its first few years had been a powerful voice for social change was eventually co-opted by business interests, who sought to make the Lobby a trade association.(79) At the community level, groups were organized to help meet the needs of the poor and minorities. Journals such as *Sun Times*, *Power Line*, and *Critical Mass Journal* reported on solar energy news. Many books were published on solar energy including several by Amory Lovins; Ray Reece, *The Sun Betrayed*; Barry Commoner, *The Poverty of Power* and *The Politics of Energy*; Richard Grossman and Gail Daneker, *Energy, Jobs, and the Economy*; and Ken Bossong, *A Solar Critique: Solar Compendium*. Alternative energy fairs became a part of antinuclear events, e.g., regional alliances such as the Clamshell alliance and the Texas Mobilization for Survival sponsored alternative energy fairs. In Austin, Texas the antinuclear movement sought to develop a peoples' energy movement.(80)

The women's movement from liberal- to ecofeminists became particularly synonymous with a commitment to alternative technologies. In October 1980 NOW issued an antinuclear declaration and resolved to work with the

female leadership of the alternative-safe energy and antinuclear movement. The appropriate technology (AT) movement which advocates renewable energy sources, energy and food self-reliance, and low environmental impact technologies has been an appealing alternative for women. AT's appeal lies in the development of personal skills that allow women greater control over their lives. The New Alchemy Institute has presented workshops on "Women and Appropriate Technology," which were taught by women because women learn more and are less intimidated when carpentry and plumbing skills are taught by women. A major thrust of the workshops was to demystify technology, to nurture women's skills, and remove any mental blocks women might have about working with tools.(81)

One of the best examples of people taking control of their energy needs occurred in Crystal City, Texas. In the early 1960s Chicana(o)s began to wrest control of city and county offices. In 1975 Lo Vaca Gathering Co. informed 200 Texas cities that it would no longer provide natural gas at the 1972 contract price. In one jump, the price of 1000 cubic feet (mcf) soared from 35 cents to \$2.00, a rate increase of 500 percent. While San Antonio and other cities reluctantly accepted the increase, the Crystal City Council passed an ordinance insisting that Lo Vaca abide by the terms of its 1972 contract with the city.(82) The city billed customers at the old rate and put the money in escrow. After two years of litigation in state courts Lo Vaca was allowed the rate increase. On 24 September 1977 gas service was cut off to Crystal City (population 8,000 and one of the poorest cities in Texas).

At that point, Crystal City embarked on a course of energy independence. The County Judge, Jose Angel Gutierrez, one of the founders of the La Raza Unida Party, declared Crystal City a disaster area. Temporary help was received from Sen. Edward Kennedy and the Community Services Administration (CSA) in the form of money to buy canisters of butane to help local residents through the winter. However, the butane was still expensive and not renewable. The local energy crisis was finally resolved, when the city was able to obtain surplus Korean woodstoves from Army surplus stations, which were then distributed to local residents. These woodstoves are fueled by mesquite which is abundant and grows rapidly in that part of the country. Crystal City was also able to obtain help from Pliny Fisk, an Austin-based alternative energy pioneer, who designed an inexpensive solar water heater which could be attached to the woodstoves. Many of these solar water heaters have been installed in Crystal City. The city continues to make do without any natural gas. Crystal City is one of the few cities in the country (Davis, California is another) that has made a partial transition to renewable energy resources.(83)

3.3.4 Ecofeminism

Finally, the ecofeminists have had a growing impact on the antinuclear movement. While the soft energy movement has given the antinuclear power movement an alternative to nuclear power, the ecofeminist movement may give it a theoretical foundation. The antinuclear movement has been a single issue movement, cutting across ideological lines, lacking a consistent set of theories that could explain its opposition to nuclear power. Ecofeminism "refers to a sensibility, an intimation that feminist concerns run parallel to, are bound up with, or, perhaps, are one with a concern for a natural world which has been subjected to much the same abuse and ambivalent behavior as have women."(84) For example, the civilian nuclear power program was developed without any thought as to what it would do to the natural environment. It took almost twenty years for environmentalists to force the industry to take basic measures to protect the environment. Moreover, the kinds of technologies that are needed are those that will not disrupt, abuse, or dominate the environment, such as soft technologies.

The ecology movement and the women's movement simultaneously reemerged in the late 1960s after a period of dormancy and began to converge in the late 1970s and 1980s with the emergence of an ecofeminist perspective. According to Karen J. Warren, the four minimal claims to ecofeminism are the following: "(1) there are important connections between the oppression of women and the oppression of nature; (2) understanding the nature of these connections is necessary to any adequate understanding of the oppression of women and the oppression of nature; (3) feminist theory and practice must include an ecological perspective; and (4) solutions to ecological problems must include a feminist perspective."(85) Ecofeminism is an attempt to understand the domination of nature, the domination of women, and other oppressed minorities. The central project of ecofeminism is the "unpacking of the connections between the twin oppressions of women and nature."(86) Ecofeminists have identified a *patriarchal conceptual framework* that is influenced by such factors as sex-gender, race, class, age, sexual preference, religion, and nationality, which sanctions the oppression of both women and nature.(87) For example, it puts men, culture, and minds *up* and women, nature, and bodies *down*. In patriarchal

ideology, it is claimed, women are seen to be closer to nature than men and the hatred of both women and the hatred of nature are “intimately connected and mutually reinforcing.”(88)

Ecofeminists suggest that in order to identify the appropriate limits of human action within nature, the ecology movement must embrace a feminist politics because the domination of persons (especially women, since the prototype of other forms of domination is that of male domination) and the domination of nature are inextricably connected. Neither nature nor women will be liberated without an explicit confrontation of the structures of male domination. Karen Warren believes that “because of the basic connections between sexist oppression and other forms of systematized oppression, feminism properly understood is a movement to end all forms of oppression.”(89) By understanding women’s oppression we can see the ways in which humans dominate nature through technologies such as nuclear power that abuse nature.

Ecofeminism dates back to the late 1970s. The European and American antimilitarist movement of the 1980s (at Greenham Common, Seneca Falls, Pantex) have a strong ecofeminist perspective. They have made the connections between violence against women, a militarized culture, starvation, homelessness, and the poisoning of the environment. Because nuclear weapons do not exist apart from a contempt for women and all life, the issue of disarmament and the threat of nuclear war is a feminist issue.(90) Holly Near’s work is also an example of ecofeminist practice.

The Women’s Pentagon Action (WPA) also addressed the ways in which both nuclear power and nuclear weapons support a system of domination of women and nature. WPA’s objectives included the following: no more bombs; all nuclear plants decommissioned, construction of new plants stopped; an end to the mining of uranium on native American lands, which have been turned to radioactive rubble; freedom from violence on the streets and in the home; equal pay for work of equal value; an end to the oppression of lesbians; and freedom of choice in bearing children.(91) Unlike other single-issue movements, ecofeminists not only make the connections between ecology and feminism, but with other emancipatory movements. Ecofeminists recognize that they cannot separate the personal from the political and are frustrated by those parts of the larger antinuclear movement that perpetuate sexism, racism, classism, and homophobia.(92) WPA was conceived at the “Women and Life on Earth” conference(93) in Amherst, Massachusetts in the Spring of 1980 and was organized by and for women (e.g., peace activists, feminists, environmentalists, and Lesbians). The 16 and 17 November 1980 Pentagon Action attracted 2000 women participants; that number doubled to more than 4000 for the 15 and 16 November 1981 action. WPA is antihierarchical and anti-authoritarian, i.e., there were no speakers and no leaders; it was a totally participatory event.(94) The actions were planned in a way that connected militarism, naturism, and sexism.(95)

Endnotes

1. Robert Cameron Mitchell, “From Elite Quarrel to Mass Movement,” *Society* 18, no. 5 (Jul.-Aug. 1981): 76-84.
2. Pringle and Spigelman, *Nuclear Barons*, 246.
3. Anne Chisholm, “Barry Commoner: The Scientist as Agitator,” in *Philosophers of the Earth: Conversations with Ecologists* (London: Sidgwick & Jackson, 1972), 122-39.
4. Hilgartner, Bell, and O’Connor, chap. 7, “Hotter Than a \$2 Pistol,” *Nukespeak*, 87.
5. David Lehman, *Sane World* 24, 2 (Feb. 1985): 2. SANE merged with the Nuclear Freeze Campaign in November 1987.
6. Paul Boyer, “From Activism to Apathy: America and the Nuclear Issue, 1963-1980,” *Bulletin of the Atomic Scientists* 40, no. 7 (Aug.-Sept. 1984): 21; also see Barbara Deming, “Letter to WISP,” in *Revolution and Equilibrium*, 136-46 (New York: Grossman Publishers, 1971).
7. In Britain, the practice of dumping waste into the Irish Sea continued until the 1970s, which gave it the most radioactive waters in the world.
8. For example, see Boyer, “From Activism to Apathy,” 14-23.
9. Susan Koen and Nina Swaim, *Handbook for Women on the Nuclear Mentality* (Norwich, VT: WAND, 1980), 33.
10. At this early date the Sierra Club objected to the Malibu plant because it would destroy a rare tree species.
11. John Fuller, *We Almost Lost Detroit* (New York: Ballantine Books, 1975).
12. Dorothy Nelkin, “Nuclear Power as a Feminist Issue,” *Environment* (Jan.-Feb. 1981): 15.
13. Winona LaDuke, “The Mortality of Wealth: Native America and the Frontier Mentality,” *Radical America* 17, nos. 2 & 3 (Mar.-June 1983): 74.

14. Harvey Wasserman, "The Issue of Tribal Survival" in *Energy War: Reports from the Front*, (Westport, CT: Lawrence Hill & Company, 1979), 191.
15. Winona LaDuke and Ward Churchill, "Radioactive Colonization and the Native American," *Socialist Review* 15, no. 3 (May-June 1985): 102-03.
16. Rachel Carson, *Silent Spring* (Boston: Houghton Mifflin Co., 1962).
17. Ralph H. Lutts, "Chemical Fallout: Rachel Carson's *Silent Spring*, Radioactive Fallout and the Environmental Movement," *Environmental Review* 9 (Fall 1985): 210-25.
18. Rachel Carson, *The Sea Around Us*, rev. ed., (New York: Oxford Univ. Press, 1961), xi-xiii.
19. Lutts, "Chemical Fallout," 222.
20. Ibid.
21. Carson, *Silent Spring*, 18-19.
22. Chisholm, "Barry Commoner," 123-26. Although trained as a biologist, Commoner went on to become one of the best known environmentalists of the 1970s. He wrote *The Closing Circle*, considered to be one of the best books ever written on the environment.
23. Citizens can intervene at two points in the regulatory process, i.e., during the construction and operating permits hearings. Both decisions can be appealed in the courts.
24. Nelkin, "Nuclear Power as a Feminist Issue," cited the following articles: M. Hope and J. Young, "Great Nuclear Debate: Are Our Newborn Babies' Lives in Danger?" *Redbook*, Jan. 1972, 16; "Dr. Spock is Worried," *Redbook*, Aug. 1979, 66; "What you Must Know About Radiation," *Redbook*, Nov. 1979, 223; Ralph Nader, "The Menace in Your Backyard," *Ladies Home Journal*, Sept. 1978, 84; review of the Seabrook demonstrations, *MS*, Oct. 1978, 20.
25. Koen and Swaim, *Handbook for Women*, 45-46.
26. "Carrie Dickerson: Outfoxing the Nukes," *Ms*, Nov. 1982.
27. See chap. 4 for a discussion of the ECCS issue.
28. LaDuke and Churchill, "Radioactive Colonization," 108. Current mining and milling processes already use thousands of acre-feet of water per year, draining rivers and underground aquifers, which will require 5,000 to 50,000 years to effectively replenish themselves. (One acre-foot is the volume of water that would cover one acre to a depth of one foot.)
29. "Targeted for Death: Native American Lives and Land Threatened by Uranium Mining," *Akwesasne Notes* 16, no. 3 (Spring 1984): 10.
30. In 1989 Peter McDonald of CERT was forced to step down under pressure from Congress because of fraud.
31. Cameron, "From Elite Quarrel to Mass Movement," 80.
32. Richard Grossman and Jordan Barab, "Labor: An Exercise in Power," *Environment*, Nov. 1980, 41. See also Jim Falk, *Global Fission: The Battle Over Nuclear Power* (London: Oxford Univ. Press, 1982), 246.
33. There is strong resistance to CWIP, because utilities would be allowed to charge customers for a service that they have yet to receive.
34. For example, 84.3 percent of the Energy Research and Development Administration's so-called new staff were former AEC employees. Ralph Nader and John Abbots, *The Menace of Atomic Energy* (New York: W. W. Norton & Co., 1977), 278.
35. See the Hollywood film *Silkwood*.
36. Anna Gyorgy and friends, *No Nukes: Everyone's Guide to Nuclear Power* (Boston: South End Press, 1979), 49.
37. See Alan S. Miller, "Towards an Environmental-Labor Coalition," *Environment*, June 1980, 32-39.
38. For an in depth survey of the Clamshell Alliance see Ethan Micah Cohen, "Ideology, Interest Group Formation, and Protest: The Case of the Anti-Nuclear Power Movement, the Clamshell Alliance, and the New Left," Ph.D. diss., Harvard Univ., 1981.
39. Harvey Wasserman, "The Clamshell Reaction," *The Nation*, 18 June 1977, 744-49.
40. See *Hot Times*, the newsletter of the Texas Mobe.
41. *Power Line*, Mar.-Apr. 1986, 12.
42. Pamela Haines and William Moyer, "'No Nukes' is Not Enough," *The Progressive*, Mar. 1981.
43. This strategy of exerting pressure from inside a corporation is currently being used against Exxon to protest its irresponsibility in the Exxon Valdez oil tanker spill of March 1989. Some Exxon stockholders took their protest to a stockholders' meeting in May 1989. Additionally, environmentalists were able to obtain a promise from Exxon to place an environmentalist on the Board of Directors. In times of disaster such a strategy can be effective, taking advantage of a large groundswell of moral outrage.
44. NOW's and the YWCA's antinuclear position are discussed in Nelkin, "Nuclear Power as a Feminist Issue," 16-17.

45. *No Nuclear News*, Nov. 1981, 9.
46. See section 3.3.4 Ecofeminism
47. Nelkin, "Nuclear Power as a Feminist Issue," 20-21.
48. Gina Foglia and Dorit Wolffberg, "Spirituality in Feminist Anti-Nuclear Activism," in *Spirituality as a Political Force*, edited by Charlene Spretnak (Garden City, NY: Doubleday, 1982), 451-454.
49. Koen and Swaim, *Handbook for Women*, 35; "Women of all Red Nations (WARN)," *Akwesasne Notes* 10, no. 5 (Winter 1978): 15.
50. "The Black Hills: Sacred Mountains Under Siege," *New Age*, June 1980, 41.
51. *Critical Mass Journal*, Dec. 1979, 5; *Not Man Apart*, May 1981, 2.
52. "Land Rights, Not Uranium Mines," *Akwesasne Notes*, Summer 1979, 22-23.
53. See "Don't Sacrifice the Black Hills," *Not Man Apart*, Nov. 1980, 12 and "The Black Hills Alliance," *Akwesasne Notes*, Summer 1979, 24.
54. LaDuke, "The Mortality of Wealth," 78-79.
55. *Akwesasne Notes*, Late Spring 1986, 19.
56. *New York Times*, 4 Feb. 1988.
57. In the mid-1970s Barry Commoner wrote *Poverty Of Power*, which critiqued nuclear power and centralized energy systems, but favored solar power as a replacement for nuclear power.
58. *The Citizens Party Draft Platform (1981), with Changes from the 1982 Convention*. Mimeo; John Judis, "Birth pangs on the Left," *The Progressive*, June 1980, 42.
59. Wolfgang Rudig, "The Greening of Germany," *The Ecologist* 13, no. 1 (1983): 36; Horst Mewes, "The West German Green Party," *New German Critique* (Winter 1983): 54-55.
60. *AFL-CIO News*, 27 Mar. 1976, 1, cited in Falk, *Global Fission*, 247.
61. Miller, "Towards an Environmental-Labor Coalition," 36.
62. Richard Kazis and Richard L. Grossman, *Fear at Work: Job Blackmail, Labor and the Environment* (New York: Pilgrim Press, 1982), 256.
63. *Ibid.*, 263-71.
64. *Ibid.*, 254.
65. *New York Times*, Nov. 1988.
66. Christopher Flavin, "Reassessing Nuclear Power," *State of the World—1987: A Worldwatch Institute Report on Progress Towards a Sustainable Society* (New York: W. W. Norton, 1987), 65. The percentages are the Worldwatch Institute's own calculations based on Gallup and other polls.
67. Malcom W. Browne, "The 1986 Disaster at Chernobyl: A year Later, Lessons are Drawn," *New York Times*, 26 Apr. 1987, 1.
68. Brian Jacobs, "Chernobyl: The Anniversary That No one is Celebrating," *In These Times*, 22-28 Apr. 1987, 13.
69. Rebecca Logan and Dorothy Nelkin, "Labor and Nuclear Power," *Environment*, Mar. 1980, 6.
70. Daryl Herald (Austin), 6 Aug. 1986, 6.
71. "The Anti-Union, Pronuke Contractors," *Southern Exposure* 7, no. 4 (Winter 1979): 34.
72. *Ibid.*, 36.
73. Amory Lovins, "Energy Strategy: The Road Not Taken," *Foreign Affairs* 55, no. 1 (Oct. 1976), 65-96.
74. *No Nuclear News*, May 1981, 34, originally in CAARE Newsletter, May 1981.
75. Wasserman, "The Promise and Threat of Solar Power," *Energy War*, 230.
76. David Talbot and Richard E. Morgan, *Power and Light: Political Strategies for the Solar Transition* (New York: The Pilgrim Press, 1981); Ed Quillen, "Soft Path in the Rockies: At Home with Hunter and Amory Lovins," *Utne Reader* (Aug.-Sept. 1986), 62-69.
77. See Midnight Notes Collective, "The Work/Energy Crisis and the Apocalypse."
78. "Make the Media Work for You," *Sun Times*, Oct. 1980, 12.
79. Roger Pollak, "Solar Power: The Promise Fades," *The Progressive*, Sept. 1984, 34-35.
80. See *Hot Times*.
81. Patricia Logan, "Hands on Workshop for Women," *Sun Times*, Sept. 1980, 4-5.
82. See Tim Brick, "Crystal City is Cold," *The Nation*, 26 Nov. 1977, 559-61.
83. *Texas Observer*, 24 Jan. 1986, 14; *Hot Times*, Oct. 1980, 1; Harvey Wasserman, "An Energy Rebellion," *The Progressive*, Aug. 1978.
84. Jim Cheney, "Eco-Feminism and Deep Ecology," *Environmental Ethics* 9, no. 2 (Summer 1987): 115.
85. *Ibid.*, 4-5.
86. *Ibid.*, 6.
87. Ecofeminists include the following: Elizabeth Dodson Gray (*Why the Green Nigger? Re-Mything Genesis*, 1979), Ynestra King ("Feminism and the Revolt of Nature," *Heresies # 13*, 1981), Dolores LaChapelle (*Earth*

Wisdom, 1978), Susan Griffin (*Women and Nature*, 1978), Starhawk (*Dreaming the Dark Magic: Magic, Sex and Politics*, 1982), and Ariel Salleh ("Deeper than Deep Ecology: The Eco-Feminist Connection," *Environmental Ethics* 6, 1984).

88. Ynestra King, "Toward an Ecological Feminism and a Feminist Ecology," in *Machina Ex Dea*, Joan Rothschild, ed., (New York: Pergamon Press, 1983), 118.

89. Warren, "Feminism and Ecology," 8.

90. King, "Toward an Ecological Feminism," 125.

91. Foglia and Wolffberg, "Spirituality," 455-56.

92. *Ibid*, 459-60.

93. Organizers included Ynestra King, Anna Gyorgy, Celeste Wesson, and Grace Paley.

94. *No Nuclear News*, Dec. 1981-Jan. 1982.

95. For a description of the WPA, see the following: Interview with Donna Warnock, "Mobilizing Emotions: Organizing the Women's Pentagon Action," *Socialist Review* 12, nos. 3-4 (May-Aug. 1982): 37-47; King, "Toward an Ecological Feminism," 126-27; Foglia and Wolffberg, "Spirituality."