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PATTERNS OF ENVIRONMENTAL CONFLICT OVER INDUSTRIAL FACILITIES IN THE UNITED STATES, 1970-78*

THOMAS N. GLADWIN**

Alaska, Baltimore Canyon, Creys-Malville, Fraser Island, Gorleben, Hopewell, Kairparowits, Kaiseraugst, Long Beach, Love Canal, Minamata Bay, Powder River Basin, Rotterdam, Sao Paulo, Seabrook, Seveso, Silver Bay, Snowdonia, Three Mile Island, Windscale . . . these are just a few of the many thousands of sites around the globe where major battles over the environmental impacts of existing or proposed industrial facilities were fought during the 1970s. Historians many years from now are surely going to label this decade the "golden age of environmental conflict." All of them will note how societies like the United States struggled with complex tradeoffs among job creation vs. clean air, energy development vs. wilderness preservation, growth vs. non-growth, risks vs. costs, hypotheses vs. facts, freedom vs. regulation, equity vs. efficiency, idealism vs. pragmatism, and even snail darters vs. dams. Some of the historians will undoubtedly argue that environmental conflict served to reduce economic growth, induce energy shortages, change industrial geography, burden the court system, foment civil disobedience, and divert valuable time and resources from truly creative and productive activity. Others, however, will just as vigorously stress that such conflict served to protect human health, conserve critical natural areas for the benefit of future generations, stimulate environmentally-oriented planning, enhance the quality of life, and bring about a new synthesis of development and environment more compatible with the limits of the Earth as a natural system. No matter what view is taken, all will certainly agree that environmental conflict was one of the most complex, difficult, pervasive, and consequential challenges ever faced by modern industrial society.

But we need not wait for the historians of the future, for environmental conflict is already being studied from many angles and in

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many ways.¹ Perhaps the most common approach is that of detailed individual case histories.² The case study method allows the observer to dig deep into the social psychology or political science of a particular dispute, and is thus of great value, particularly from the standpoint of generating hypotheses. The inherent limitations of the "micro" case study approach (i.e., absence of control, heavy reliance on subjectivity, many variables-small sample, etc.), however, have led many who investigate social conflict to move to "macro" quantitative studies. The study of a large sample of cases facilitates hypothesis testing, permits the use of statistical techniques, and can thus result in carefully controlled general empirical propositions.

This paper reports partial results from such a large-scale statistical study that has focused on the broad experience of environmental conflict over industrial facilities in the 1970s. This aggregate approach lends itself nicely to shedding some light on the question of "whither environmentalism." For waging conflict with the "industrial enemy" in order to prevent adverse, or compel beneficial, environmental impacts has obviously been one of the most important "social functions" of the environmental movement. By pinpointing patterns and trends in the nature of environmental conflict, there-

1. T. Gladwin, *The Management of Environmental Conflict: A Survey of Research Approaches and Priorities* (Jan. 1978) (Working Paper #78-09, Graduate School of Business Administration, New York University). See also L. Susskind, J. Richardson & K. Hildebrand, *Resolving Environmental Disputes: Approaches to Intervention, Negotiation and Conflict Resolution* (June 1978) (Project Paper, Environmental Impact Assessment Project, Laboratory of Architecture and Planning, MIT).

2. See, e.g., P. BALDWIN & M. BALDWIN, *ONSHORE PLANNING FOR OFFSHORE OIL: LESSONS FROM SCOTLAND* (1975); P. BRADFORD, *FRAGILE STRUCTURES: A STORY OF OIL REFINERIES, THE NATIONAL SECURITY, AND THE COAST OF MAINE* (1975); L. CALDWELL, L. HAYES & I. MACWHIRTER, *CITIZENS AND THE ENVIRONMENT: CASE STUDIES IN POPULAR ACTION* (1976); L. CARTER, *THE FLORIDA EXPERIENCE: LAND AND WATER POLICY IN A GROWTH STATE* (1974); R. EASTON, *BLACK TIDE: THE SANTA BARBARA OIL SPILL AND ITS CONSEQUENCES* (1972); S. EBBIN & R. KASPER, *CITIZEN GROUPS AND THE NUCLEAR POWER CONTROVERSY* (1974); H. FEIVESON, F. SINDEN & R. SOCOLOW, *BOUNDARIES OF ANALYSIS: AN INQUIRY INTO THE TOCKS ISLAND DAM CONTROVERSY* (1976); B. GIBBONS, *WYE ISLAND: OUTSIDERS, INSIDERS, AND RESISTANCE TO CHANGE* (1977); R. GREGORY, *THE PRICE OF AMENITY: FIVE STUDIES IN CONSERVATION AND GOVERNMENT* (1971); R. KIMBER & J. RICHARDSON, *CAMPAIGNING FOR THE ENVIRONMENT* (1974); R. LEWIS, *THE NUCLEAR POWER REBELLION* (1972); A. LOVINS, *ERYRI: THE MOUNTAINS OF LONGING* (1971); J. MITCHELL, *LOSING GROUND* (1975); D. NELKIN, *JETPORT: THE BOSTON AIRPORT CONTROVERSY* (1974); J. NICOLSON, *SHETLAND AND OIL* (1975); B. RICHARDSON, *STRANGERS DEVOUR THE LAND* (1975); J. ROSCOW, *800 MILES TO VALDEZ: THE BUILDING OF THE ALASKA PIPELINE* (1977); F. SCHAUMBURG, *JUDGMENT RESERVED: A LANDMARK ENVIRONMENTAL CASE* (1976); W. SMITH & A. SMITH, *MINAMATA* (1975); A. TALBOT, *POWER ALONG THE HUDSON: THE STORM KING CASE AND THE BIRTH OF ENVIRONMENTALISM* (1972); T. WHITE-SIDE, *THE PENDULUM AND THE TOXIC CLOUD* (1979).

fore, we can gain useful insights regarding the possible future path of the environmental movement, particularly as it may find expression and perform on the "firing line."

The Environmental Conflict Project

The empirical survey reported here is a product of the "Environmental Conflict Project," under the direction of the author, at the Graduate School of Business Administration of New York University.³ The overall purpose of the project, which is supported in part by a grant from the Rockefeller Foundation, is to provide empirical and theoretical generalizations of relevance to policy and practice in regard to the constructive management of environmental disputes. Much of the work to date has been aimed at empirically documenting temporal, spatial, and industrial trends in the emergence and character of such conflict around the world, and specifying patterns in the changing composition of issues, actors, tactics, resolution mechanisms, and outcomes involved. The ultimate objective is to develop a unified body of substantive theory regarding the causes, course, and effective management of environmental conflict.

The central methodology being employed can be described in summary and step-wise fashion as follows: (1) systematic, page-by-page scanning of a range of U.S. and foreign newspapers, journals, and magazines for the period 1970 to present; (2) clipping of every article and item pertaining to an environmental dispute; (3) creation of files for each and every site-specific conflict over an industrial facility; (4) bolstering of clippings files, where possible, with related books, hearing transcripts, court records, etc.; (5) development and testing of a standardized codesheet largely composed of a fixed set of close-ended questions (with answers convertible to machine-readable numbers); (6) "interviewing" of the data assembled on each dispute by trained graduate student "reader-analysts," and coding of information on three dozen characteristics of each dispute; (7) strict reliance in coding only on the explicit content of the assembled literature on each case; (8) careful monitoring, reliability testing, and rechecking of the coding operations; (9) keypunching of the coded case information, file editing, and creation of an operational computer data base; and (10) employment of computer-based descriptive and statistical methods in analyzing the data.

Environmental conflict has been operationally defined in behavioral, interorganizational, and observable terms along lines sug-

3. For descriptions of the project see Gladwin, *supra* note 1; Gladwin, *Environmental Conflict*, 2 EIA REV. 48 (1978).

gested by Katz and Kahn: "Two systems . . . are in conflict when they interact directly in such a way that the actions of one tend to prevent or compel some outcome against the resistance of the other."⁴ Disputes described in the scanned literature entered the formal data base whenever evidence was provided of conflictful behavior (i.e., hindering, compelling, injuring against resistance) among two or more actors arising from impacts of a facility on the environment. Such was the case, for example, with regard to Dow Chemical Company's plans unveiled in 1975 for a \$500-million petrochemical complex northeast of San Francisco. The proposal met with unremitting opposition from regulatory agencies such as the Bay Area Pollution Control District and environmental groups such as the Sierra Club and Friends of the Earth on air quality and other grounds. The title of one report on the case captured the essence of the struggle: "Can a Quiet Agricultural County on the Sacramento River Find True Happiness with a Huge, Messy Chemical Plant?"⁵ Dow abandoned the project in 1977 after spending \$4.5 million in a futile attempt to obtain 65 approvals needed for the plant that would have employed 1,000 workers.

As of 1979, data has been collected on approximately 3,000 such disputes spanning some 40 nations. Sector studies have guided the project's coding and computer analysis activities. The results reported here, for example, are from our "Chemical Process Industry" data set.⁶ The composition of this set was determined by including every single site-specific environmental battle over an industrial facility ever mentioned in either *Chemical Week Magazine* or *European Chemical News* during the period January 1, 1970, through June 30, 1978 (442 weeks of coverage).⁷ Data files bearing upon the 587 cases of conflict gathered from these two "base" information sources

4. D. KATZ & R. KAHN, *THE SOCIAL PSYCHOLOGY OF ORGANIZATIONS* 613 (2d ed. 1978).

5. Storper & DesRochers, *Can A Quiet Agricultural County on the Sacramento River Find True Happiness with a Huge, Messy Chemical Plant?* 1976 NOT MAN APART 1.

6. The assistance of Patrick P. McCurdy, Editor-in-Chief of *Chemical Week Magazine* in providing source materials for this data set is gratefully acknowledged. The "Environmental Conflict Project" has also constructed conflict data sets on minerals, mining, occupational health and safety, and energy supply facilities. The "Chemical Process Industry" set was the first one selected for conversion to a computer data base. It was chosen on grounds of prior research foundations, information availability, and pervasiveness of conflict episodes. We believe the set to be representative of all environmental conflicts over industrial facilities. It may not, however, be representative of conflicts over public works projects such as highways or dams, given the different incentive systems under which governmental agencies, as opposed to private corporations, operate.

7. Only conflicts which emerged after January 1, 1970, were included in the trend analysis efforts. More than 100 conflicts which emerged in the 1960s but were mentioned in news reports in the 1970s were thus excluded from portions of the data analysis.

were supplemented by related articles drawn from two dozen other secondary literature sources, ranging from *The New York Times* and *Business Week* to *The Sierra Club Bulletin* and *Not Man Apart*.⁸ Altogether, approximately 6,000 different articles were assembled on the pool of cases. Of the total sample, 366 of the disputes occurred in the U.S. and 221 of them overseas. The focus below is mainly on the U.S. subsample of this chemical process industry case collection and is largely limited to descriptive reporting. Analyses of the foreign data, as well as exploratory causal analysis efforts using multivariate statistical methods, are reported elsewhere.⁹

Some of the key strengths and limitations of the quantitative survey approach should be briefly noted. The systematic and replicable method facilitates the much-needed aggregative function. And the exhaustive acquisition of data on the entire universe of media-reported conflicts permits one to assess patterns and trends in the nature of environmental conflict which could not otherwise be done using more casual techniques of observation and sample selection. But the results of the survey are naturally of no better quality than the quality of the original secondary source data. Major reporting biases may in fact be present (i.e., toward environmental disputes of large size, high intensity, long duration, and in close proximity to wire service locations). Other problems include potential distortion in the content of assembled literature, including inaccurate reporting, along with differential completeness of data across conflict cases. The method, in its focus on aggregating general features of environmental conflict, may not give sufficient attention to the unique features of individual cases. General problems of reliability associated with massive coding operations and of validity associated with cross-sectional analysis (i.e., absence of detailed information about temporal sequences) are also confronted. These limitations should be kept in mind as we highlight some of the survey's findings.

8. These secondary sources, drawn on for various time periods include: AMBIO, ATLAS WORLD PRESS REVIEW, AUDUBON, BUSINESS INTERNATIONAL, BUSINESS & SOCIETY REVIEW, BUSINESS WEEK, CHEMICAL & ENGINEERING NEWS, CONSERVATION FOUNDATION LETTER, THE ECOLOGIST, THE ECONOMIST, ENVIRONMENT, ENVIRONMENTAL ACTION, ENVIRONMENTAL POLICY AND LAW, ENVIRONMENTAL SCIENCE & TECHNOLOGY, EUROPE ENVIRONMENT, EUROPEAN BUSINESS, FORTUNE, THE INTERNATIONAL HERALD TRIBUNE, THE LIVING WILDERNESS, MANAGER MAGAZINE, NEW SCIENTIST, THE NEW YORK TIMES, NOT MAN APART, LE NOUVEL ECONOMISTE, NRDC NEWSLETTER, THE OIL & GAS JOURNAL, PETROLEUM ECONOMIST, SCIENCE, SIERRA CLUB BULLETIN, VISION, THE WALL STREET JOURNAL, and WORLD ENVIRONMENTAL REPORT.

9. For the foreign data see T. GLADWIN & I. WALTER, MULTINATIONALS UNDER FIRE: LESSONS IN THE MANAGEMENT OF CONFLICT (1980). For the multivariate causal analyses contact the author for recent working papers.

The Sample

Table 1 shows the composition of the 366 U.S. environmental battles which resulted from our 1970 to mid-1978 scanning. As would be expected from the base chemical industry literature relied upon, nearly half of the reported conflicts were fought over chemical process facilities, while the remainder involved disputes in related industrial sectors. These latter conflicts found their way into the chemical industry literature mainly because of their input-providing (e.g., electric utility or mineral mining) or output-using or handling (e.g., ferrous metal, transport and storage) nature. In the nuclear power sector, therefore, the sample includes 40 cases of conflict that were deemed "significant" to the chemical process industry (i.e., were the subject of reporting in the chemical news). The sample, as such, may not be truly representative of the entire nuclear conflict scene in the United States.

Sixty-two percent of the battles in the sample were waged over environmental aspects of facilities already in existence, while the other 38 percent as shown in Table 1 involved either expansions of facilities at existing production sites or new "greenfield" plant proposals. Disputes involving nonferrous and ferrous metal, pulp and paper, and inorganic and organic chemical facilities were largely over impacts of existing operations. Conflicts over expansions or new proposals were concentrated in the petrochemical, oil refinery, nuclear power, (non-nuclear) electric utility, transport and storage facility, and mineral mining sectors. An important pattern discovered in this regard is that:

Environmental conflict is focusing on change—the focus is shifting from old to new targets, from existing pollution problems to potential environmental impacts, and from "band-aid" remedies to preventive or risk reduction measures.

Over the years, there has been a definite shift in focus from existing to greenfield projects as targets of environmental concern; battles over expansions and new proposals rose from a 13 percent share in 1970-71 to a 53 percent share in 1974-75 (dropping back somewhat to 41 percent in 1976-78). This largely reflects the fact that pollution problems at many existing operations were apparently corrected as a result of citizen group and governmental pressure. Two-thirds or more of the conflicts in the Northeast, Southeast, and Midwest centered on existing facilities, while close to one-half of the Southwest and Far West battles involved new proposals. Another significant trend can be noted:

TABLE 1
 Composition of U.S. Environmental Conflict Sample
 (366 conflicts; 1970-78 scanning; % rounded off)

Type of Facility	Number of Cases	Percentage of Total Sample	Nature of Facility:		Location of Facility:						Year of Conflict Emergence:						
			Existing %	Expansions and New Proposals %	North-East %	South-East %	Mid-West %	South-West %	Far West %	1970-1971		1972-1973		1974-1975		1976-1978	
										%	%	%	%	%	%	%	%
Petrochemical	18	5	44	56	18	29	6	41	6	21	21	21	21	21	21	36	
Oil Refinery	29	8	42	58	62	8	23	8	38	24	19	19	19	19	19	19	
Nonferrous Metal	22	6	70	30	21	16	10	32	21	37	32	16	16	16	16	16	
Ferrous Metal	26	7	96	4	43	9	26	0	29	35	29	6	6	6	6	6	
Pulp and Paper	22	6	95	5	20	15	25	5	35	59	23	6	12	12	12	12	
Nuclear Power	40	11	37	63	20	29	31	14	6	35	17	17	31	31	31	31	
Electric Utility	11	3	44	56	20	20	20	20	20	50	0	37	13	13	13	13	
Transport and Storage	33	9	18	82	48	10	7	14	21	28	11	33	28	28	28	28	
Mineral Mining	40	11	36	64	6	34	0	37	23	19	25	38	19	19	19	19	
Inorganic Chemical	62	17	81	19	35	29	17	15	4	46	26	15	13	13	13	13	
Organic Chemical	40	11	100	0	44	19	22	14	0	29	29	12	29	29	29	29	
Other	23	6	68	32	53	11	26	0	18	24	12	47	47	47	47	47	
Total Sample	366	100	62	38	33	20	15	21	11	34	24	20	22	22	22	22	

Environmental conflict is spreading—locationally from the “Frostbelt” to the “Sunbelt” (although once conflict emerges in any particular region, it remains) and industrially to all types of facilities and phases of the production process (i.e., from extraction all the way through product disposal).

The top ten states for reported conflict, in descending order according to number of cases, were New Jersey, California, Texas, Pennsylvania, Illinois, Florida, Washington, New York, Delaware, and Ohio. These ten hotspots accounted for 58 percent of all reported conflict. Viewed on a regional basis, Table 1 reveals that 33 percent of the battles took place in the Northeast, 20 percent in the Southeast, 15 percent in the Midwest, 21 percent in the Southwest, and 11 percent in the Far West. Over time, however, the overall share of environmental conflict accounted for by the Northeast and Midwest declined markedly—from a combined share in 1970-71 of 59 percent to one in 1976-78 of 38 percent. This shift in the location of environmental disputes in favor of the “Sunbelt” is in accordance with the general shift of new industrial capital spending in that direction. But on a national basis, another finding must be emphasized:

Environmental conflict is continuing—the amount of reported conflict over industrial facilities has not diminished since 1972, despite energy crises and recessionary conditions. The evidence indicates that environmental conflicts interact and feed forward via domino, contagion, diffusion, and learning processes.

As Table 1 reveals, one-third of the reported disputes over the entire eight and one-half year study period emerged during the first two years. The period 1970-71, of course, marked the “age of alarmed discovery and euphoric enthusiasm” regarding the environmental movement in the United States.¹⁰ The remaining two-thirds of the battles were spread rather equally over the next six and one-half years. It should be noted, however, that our scanning operations revealed a significant lag in media reporting of conflicts, with coverage apparently dependent upon the disputes reaching some threshold level of media-attracting intensity. For this reason, the 1976 to mid-1978 share of 22 percent is somewhat understated. (Scanning since the computer data base cut-off date of July 1978 has indeed revealed four dozen battles which emerged in 1977 and early 1978

10. Downs, *Up and Down with Ecology—The “Issue-Attention” Cycle*, 28 PUB. INTEREST 38 (1972).

but did not make it into the computerized data base.) The key point is that the amount of reported environmental conflict over industrial facilities has evidently remained relatively constant since 1972. It has perhaps even increased, given that capital spending in the chemical process industries declined in constant value dollars in the United States from 1974 to 1977. And data for 1979 indicates a massive upsurge in reported conflict, particularly in regard to hazardous waste disposal sites and nuclear power plants, as a result of the Love Canal and Three Mile Island disasters respectively. Such incidents induced waves of related environmental battles by attracting media coverage and arousing public concern.

The Issues

Many kinds of issues can be found at stake in environmental conflicts, which have an important bearing on the intensity of the struggle, the duration of required interaction, and the general difficulty of reaching agreement. Research on conflict in general, for example, has shown that disputes tend to become more difficult to resolve the greater the extent to which the issues at stake are intangible, highly uncertain, irreversible in outcome, over large precedents, few in number with no tradeoffs among them possible, ideological in content, closely intertwined, generalized, broad and diffuse, abstract, similarly ranked in importance by both parties, difficult in terms of finding solutions, over general principles, and "winner-take-all" or zero-sum in character.¹¹

We considered the following eight topical categories of issues in our survey: (1) *air quality* (pollution, visibility, odor); (2) *water quality* (degradable/nondegradable/persistent/residuals); (3) *land use* (landscape, scenery, wilderness, erosion, solid waste); (4) *biota* (vegetation, wildlife, biological effects, ecological balance); (5) *minerals* (fuel, nonfuel); (6) *human health and safety* (disease, noise, radioactivity, accidents, genetic and reproductive effects); (7) *social resources* (recreation, residential, cultural, life style, congestion, boomtowns); and (8) *economic resources* (property values, tax, income, employment). The last three represent *primary issues* in the sense of being disputed in terms of manifest or direct human impacts, while the first five can be viewed as *secondary issues*, that is, those not

11. See M. DEUTSCH, *THE RESOLUTION OF CONFLICT: CONSTRUCTIVE AND DESTRUCTIVE PROCESSES* (1973); D. DRUCKMAN, *NEGOTIATIONS: SOCIAL-PSYCHOLOGICAL PERSPECTIVES* (1977); I. MORLEY & G. STEPHENSON, *THE SOCIAL PSYCHOLOGY OF BARGAINING* (1977); J. RUBIN & B. BROWN, *THE SOCIAL PSYCHOLOGY OF BARGAINING AND NEGOTIATION* (1975); P. SWINGLE, *THE MANAGEMENT OF POWER* (1976); I. ZARTMAN, *THE NEGOTIATION PROCESS: THEORIES AND APPLICATIONS* (1978).

necessarily or not yet translated into matters of direct human impact.

Table 2 provides summary data regarding issue type and number. On average, 1.8 issues were disputed per conflict in the United States, with the three most frequent types being water quality (present in 59 percent of the battles), air quality (31 percent), and human health (22 percent). An inspection of the data reveals a fundamental pattern found throughout this survey:

Environmental conflict varies tremendously in character—the structure and substance of battles differ widely among nations, regions, types and natures of facilities, and times of emergence. No two environmental battles are totally alike, and variations in their characteristics are critically important in designing and applying appropriate methods of conflict management.

In comparison with the pool of 221 reported conflicts overseas (the bulk of which occurred in the Netherlands, United Kingdom, West Germany, Japan, Italy, France, Belgium, Canada, Spain, and Sweden), water quality issues were more frequent in U.S. battles, while air quality and human health issues were much less frequent. Variations were also discovered among regions of the United States, with air quality most frequent in the Southwest, water quality in the Northeast, human health in the Midwest, and land use, mineral base, social, and economic impacts in the Far West. Such variations reflect different kinds of environmental resources under heavy pressure.

The main determinant of issues, of course, was the type of facility involved (i.e., the nature of its environmental impacts). Air quality issues, for example, were most frequent in battles over electric utilities (e.g., the cancelled coal-fired power plant of Southern California Edison, et al., at Kairparowits, Utah), and metal facilities such as smelters and steelworks. Water quality issues, in comparison, were at stake in 90 percent of all the pulp and paper disputes (e.g., International Paper's battle with the state of Vermont over the firm's mill at Ticonderoga, New York) and in a majority of the petrochemical, transport and storage, inorganic, and organic sector conflicts. Land use and minerals base issues were especially prominent in mining conflicts, while biotic impact issues were most frequent in transportation facility struggles (e.g., the epic Trans-Alaska oil pipeline battle of Alyeska Pipeline Service). Concerns of human health and safety were found most frequently in conflicts over inorganic chemical plants, nuclear power stations, and non-ferrous metal facilities (e.g., Kennecott's difficulties in the early 1970s with its copper smelters in

TABLE 2
Issues in U.S. Environmental Conflict
 (366 conflicts; 1970-78 scanning; % rounded off and means)

Categories and Conflict N	Secondary							Types of Issues				Primary		Mean Number of Issue Types
	Air	Water	Land	Biota	Minerals	Health	Social	Economic						
1. All U.S. Conflicts (366)	31%	59%	16%	18%	3%	22%	14%	18%	1.8					
All Foreign Conflicts (221)	51	46	13	23	1	45	11	21	2.1					
2. U.S. Location														
Northeast (121)	28	66	14	20	4	20	18	17	1.9					
Southeast (73)	17	63	20	23	1	21	16	16	1.8					
Midwest (55)	28	66	3	9	2	30	6	16	1.6					
Southwest (77)	50	43	19	18	4	26	11	22	1.9					
Far West (40)	30	49	27	21	6	6	21	24	1.8					
3. Type of Facility														
Petrochemical (18)	56	63	19	25	0	25	25	31	2.4					
Oil Refinery (29)	44	44	32	16	8	12	28	20	2.1					
Nonferrous Metal (22)	80	35	25	20	10	35	10	25	2.4					
Ferrous Metal (26)	67	43	0	5	0	14	0	0	1.3					
Pulp and Paper (22)	20	90	0	10	0	0	10	0	1.3					
Nuclear Power (40)	6	44	15	12	3	41	3	21	1.7					
Electric Utility (11)	80	10	10	0	0	20	30	20	1.7					
Transport and Storage (33)	11	68	21	46	4	21	36	50	2.6					
Mineral Mining (40)	17	46	63	14	17	0	31	26	2.1					
Inorganic Chemical (62)	41	57	4	16	0	25	8	14	1.7					
Organic Chemical (40)	22	83	6	25	0	47	8	17	2.1					
Other (23)	21	63	11	32	0	26	16	11	1.8					
4. Nature of Facility														
Existing (227)	29	66	6	16	1	25	7	11	1.6					
Expansion (14)	70	20	0	20	0	10	20	10	2.3					
New Proposal (125)	32	46	39	24	9	18	31	36						
5. Time of Emergence														
1970-71 (124)	27	73	7	16	2	18	9	12	1.6					
1972-73 (88)	35	51	14	8	3	19	10	14	1.6					
1974-75 (73)	34	38	27	27	9	29	21	23	2.1					
1976-78 (81)	32	48	20	17	2	38	12	15	1.9					

Utah, Arizona, Montana, and Nevada). Finally, concerns over adverse social and/or economic impacts were present most often in disputes over oil refineries, transport facilities, minerals mining, and electric utilities (e.g., classic "boomtown" struggles over power projects in Rock Springs, Wyoming, the Four Corners region, Colstrip, Montana, and Craig, Colorado).

But for the entire sample, this pattern stands out:

Environmental conflict is broadening—the issues at stake are changing, with land use, social impact, and human health concerns rapidly on the rise as central matters in contention. The name of the game is no longer simply ecology, but rather the overall quality of human life.

Water quality issues have declined dramatically in prominence—from being involved in three-quarters of all disputes in 1970-71 to only 38 percent in 1974-75 and 48 percent in 1976-78. The decline can perhaps be traced to considerable progress in cleaning up water pollution problems at existing facilities under the Federal Water Pollution Control Act Amendments of 1972, the most expensive and far-reaching effort ever undertaken by Congress in the field of environmental protection. Land use issues, on the other hand, have been on the rise, as have those of human health and safety. The control of land use, of course, has indeed undergone radical change in recent years, with the trend, at all regulatory levels and in the courts, toward ever greater constraints in the name of the overriding public interest in protecting environmental and esthetic values.¹² And the increased emphasis on health hazards, particularly in the area of environmental carcinogens, reflects a growing specification of what many consider to be the "bottom line" of the entire environmental movement. We should also note the rise over time in the number of types of issues involved in the average environmental battle. The trend, perhaps in large measure a product of the shift from "old" to "new" targets, may also reflect a broadening of the notion of the "human environment," with *primary* health, social,

12. See M. BARAM, ENVIRONMENTAL LAW AND THE SITING OF FACILITIES: ISSUES IN LAND USE AND COASTAL ZONE MANAGEMENT (1976); F. BOSSELMAN & D. CALLIES, THE QUIET REVOLUTION IN LAND USE CONTROL (1972); F. BOSSELMAN & D. FEVRER, THE PERMIT EXPLOSION (1977); J. DEVANNEY, G. ASHE & B. PARKHURST, PARABLE BEACH: A PRIMER IN COASTAL ZONE ECONOMICS (1976); R. HEALY, LAND USE AND THE STATES (1976); R. LINOWES & D. ALLENSWORTH, THE POLITICS OF LAND USE: PLANNING, ZONING AND THE PRIVATE DEVELOPER (1973); R. NELSON, ZONING AND PROPERTY RIGHTS (1977); J. NOBLE, J. BANTA & J. ROSENBERG, GROPING THROUGH THE MAZE (1977); O'Hare, *Not on My Block You Don't: Facility Siting and the Strategic Importance of Compensation*, 25 PUB. POLICY 407 (1977).

and economic impact issues increasingly being added to the more traditional *secondary* issues of general environmental quality.

The Opponents

Corporations have confronted many types of opponents in environmental disputes, with their characteristics varying in ways critical to the development, course, and resolution of the disputes. Some have been small and others very large; some have been novices and others old pros at waging conflict; some have been ad hoc and unorganized, while others long established and highly structured; some have been obsessed with a single issue, while others dallied in multiple issues; some have had abundant financial and human resources at their disposal, while others only had typewriters; some have been out for a little fun and excitement, while others have literally been willing to die or go to jail for their cause. We classified the opponents in our survey into nine topical categories: (1) *foreign governmental body*; (2) *national governmental body*; (3) *regional governmental body*; (4) *local governmental body*; (5) *national environmental groups*; (6) *regional or local environmental group*; (7) *local residents*; (8) *local industry*; and (9) *social action group*. For purposes of analysis these categories can be further classified into *governmental vs. nongovernmental* and *local vs. non-local*.

A few observations should be made before examining our opponent data. Most of the conflicts observed involved two or more opponents. An increase in the number of parties to an environmental dispute generally enhances the chances of communications failure, increases the difficulty of coordination, reduces the range of alternative solutions acceptable to all parties, and consequently increases the amount of time needed to reach agreement. Multi-party conflicts do show a persistent tendency, however, to reduce to two-party conflicts via coalitions and blocs. Parties which see themselves as sharing a common disadvantage at the hands of the corporation will often join forces and unify their resources in order to maintain or increase their individual strength. The firms, of course, just as often actively strive to prevent the formation of coalitions among weaker opposing parties.

Our focus below is on the opponents, but the involvement of other actors in the disputes should also be acknowledged. For example, the presence of interested and significant audiences has undoubtedly critically shaped the behavior of the direct protagonists in many conflicts. It is also clear that third parties have greatly influenced the course of many battles, entering into many environmental conflicts in several broad role categories: as possessors of

superior powers to impose a settlement (e.g., judges, arbitrators), as reconcilers of disparate interests (e.g., fact-finders, conciliators, mediators), and as expert assistants to one or the other contending parties (e.g., attorneys, consultants, special envoys). Full-fledged analysis of environmental disputes must naturally take into account all the proponents, opponents, audiences, and third parties. The data provided in Table 3, however, focuses only on the opponent sector.

One point to note in the Table is the dramatically higher involvement of national and regional government agencies in U.S. disputes as compared to those overseas. Environmental battles abroad have been much more a local affair, with considerably higher involvement exhibited by local governments, residents, and industries. Within the United States, one should note that national groups were involved in 32 percent of the Far West disputes—a figure more than twice the average for the nation as a whole. Perhaps the most important pattern discerned in Table 3 is this:

Environmental conflict is characterized by a division of labor among opponents—different types of opponents tend to wage conflict against different types of industrial facilities.

National and regional agencies were heavily involved in all types of facility disputes, but they found themselves without much company in the pulp and paper, ferrous metal, and organic chemical disputes. National environmental groups were strongly represented in only four of the twelve sectors: transport and storage, mineral mining, nuclear power, and (non-nuclear) electric utilities. This seems to suggest that such groups have devoted their time and energy vis-a-vis industry mainly to large scale, precedent setting, wilderness affecting, and/or highly threatening kinds of facilities. Regional and local environmental groups were also involved in these four, but exhibited a wider portfolio, with heavier involvement in many other sectors.

Likewise, local residents were present in roughly one-fifth or more of all the disputes in every category. The locals, who have to live with the effects of the facilities, thus appear more willing to oppose anything posing a perceived threat. Local industries and social action groups, according to the data, were more choosy in their targets. An example of the former is the victorious campaign of the Hilton Head Island Developers against the plans of the German chemical firm BASF for a petrochemical complex in South Carolina. A case of the latter is Ralph Nader's "Raiders" attacking Union Carbide's polluting ferroalloy plants in Ohio and West Virginia.

TABLE 3
Opponents in U.S. Environmental Conflict
(366 conflicts; 1970-78 scannings; % rounded off and means)

Categories and Conflict N	Types of Opponents										Mean Number of Opponent Types
	Governmental					Nongovernmental					
	Foreign Govt. Body	National Govt. Body	Regional Govt. Body	Local Govt. Body	National Reg./Loc. Env'tal. Group	Local Residents	Local Industry	Local Action Group	Social Action Group	7%	
1. All U.S. Conflicts (366)	1%	59%	54%	17%	15%	22%	30%	7%	7%	7%	2.1
All Foreign Conflicts (221)	4	38	27	40	11	28	45	17	10	10	2.2
2. U.S. Location											
Northeast (121)	1	60	54	19	13	28	36	8	5	5	2.2
Southeast (73)	0	62	53	12	16	15	24	7	5	5	2.0
Midwest (55)	2	64	41	16	5	18	27	3	8	8	1.9
Southwest (77)	1	53	56	22	18	28	28	7	7	7	2.2
Far West (40)	6	56	71	12	32	15	32	9	9	9	2.4
3. Type of Facility											
Petrochemical (18)	0	29	47	18	12	35	41	12	18	18	2.1
Oil Refinery (29)	4	40	60	28	0	40	52	20	8	8	2.5
Nonferrous Metal (22)	5	50	85	30	0	20	25	10	10	10	2.4
Ferrous Metal (26)	0	69	83	22	9	4	17	0	9	9	2.1
Pulp and Paper (22)	0	70	50	0	5	5	20	0	5	5	1.5
Nuclear Power (40)	0	68	32	15	38	41	35	12	15	15	2.7
Electric Utility (11)	0	70	40	0	30	20	40	10	10	10	2.2
Transport and Storage (33)	7	66	52	38	52	48	45	17	7	7	3.3
Mineral Mining (40)	0	53	44	21	35	32	27	0	6	6	2.2
Inorganic Chemical (62)	0	62	60	14	10	21	19	4	4	4	1.9
Organic Chemical (40)	0	64	64	8	3	3	36	6	0	0	1.9
Other (23)	0	53	58	21	0	11	47	0	5	5	1.9
4. Nature of Facility											
Existing (227)	1	62	57	12	5	10	24	4	4	4	1.8
Expansion (14)	0	73	55	9	0	18	18	0	0	0	2.8
New Proposal (125)	3	53	48	30	38	47	44	15	14	14	
5. Time of Emergence											
1970-71 (124)	1	61	52	12	7	17	26	8	4	4	1.9
1972-73 (88)	0	56	52	14	10	19	18	1	3	3	1.8
1974-75 (73)	2	61	54	19	25	19	29	7	10	10	2.3
1976-78 (81)	2	54	51	18	11	21	41	5	6	6	2.1

Another dimension of the division of labor is found in the data regarding nature of facility. Conflicts over expansions and new proposals attracted an average of 2.8 types of opponents, while existing facility disputes averaged only 1.8. The latter category of disputes largely involved only national or regional governmental opponents. "Greenfield" conflicts, on the other hand, attracted higher percentages of all other types of opponents. Local governmental bodies, environmental groups, residents, industries, and social action groups targeted much of their fire on new projects. National environmental groups, for example, exhibited about eight times as much involvement in conflicts over proposed as against existing facilities. They thus appear to devote the bulk of their energies to opposing perceived adverse environmental consequences to the future rather than the present, which may perhaps be explained by their relatively greater power to oppose change than to effect corrections of existing problems.

A final pattern to note about opponents is that:

Environmental conflict is decentralizing—battles increasingly involve local actors, and the mix of opponents is also shifting gradually from governmental to nongovernmental.

The trend data at the bottom of Table 3 shows recent declines in the involvement of national governmental agencies and environmental groups. It also reveals a gradually expanding role for local governmental bodies and increasingly greater involvement of local residents. The general trend is toward more frequent grass roots mobilization, perhaps as a result of growing disenchantment regarding the protection afforded by government bureaucrats or public interest groups in far-away locations.

The Tactics

Environmental opponents have pressed business firms with a wide range of tactics on practically every front: at construction sites, in the hearing rooms, in the courts, at shareholder meetings, in the media, on the streets, in city councils, state legislatures and Congress, as well as in the appointive bureaucracies of government at every level. We coded each case of conflict for the reported utilization of each of the following categories of tactics: (1) *governmental legal action*; (2) *governmental administrative action*; (3) *private legal action*; (4) *demonstration*; (5) *petition/referenda*; (6) *lobbying*; (7) *press campaign*; and (8) *violence*. Tactics can be classified in many

ways, but the distinction between *regulatory* and *social* tactics is particularly useful. Regulatory tactics involve governmental opponents through legal and administrative action, while social tactics encompass nongovernmental pressures such as those numbered (3) through (8) above.

What determines the tactics used by opponents of corporations in environmental battles? As with other aspects of conflict, it appears that many interrelated factors jointly affect preferences among, and choices of, different types of tactics by disputants. The nature of the issues giving rise to conflict are particularly important. So is the opponent group's ideology, leadership, resources, degree of organization, past experience in waging conflict, and perception of the relevant audiences' reactions. The nature of the preexisting relationship between the disputants may influence the choice of tactics, and so will the kinds of tactics employed by the other party. Corporate reliance, for example, on a strategy of power and tactics of threat, coercion, and deception is likely to elicit resistance, alienation, and similar types of countertactics on the part of its opponents.

Table 4 shows that regulatory tactics were the most frequent kind employed in the U.S. disputes. Administrative actions (e.g., delayed or denied permits, licenses, certificates, zoning variances, authorizations, etc.) were employed in nearly two-thirds of the battles. Legal actions (e.g., suits asking for civil or criminal penalties, citations, contingent injunctions, etc.) were undertaken by governmental bodies in 39 percent of the cases. Private legal actions (e.g., damage suits, class action suits, nuisance or trespass litigation, etc.) were initiated in 30 percent of the disputes. Table 4's comparative international data dramatically reveals that:

Environmental conflict is quite litigious—governmental and private legal actions have been approximately twice as prevalent in U.S. conflicts as compared to those overseas.

Why so much litigation in the United States? On the surface, one might simply note that the United States has three times as many lawyers per capita as England and 21 times as many as Japan.¹³ But the roots surely lie deeper. The United States is a society of laws, a culture preoccupied with the assertion and maintenance of individual rights. Access to the courts to redress political grievances is relatively cheap and easy and an accepted part of American life. Litigiousness

13. See *A Nation in Court*, THE ECONOMIST, November 5, 1977, at 44; *The Trouble with Lawyers*, THE NEW REPUBLIC, May 20, 1978, at 5; *The Chilling Impact of Litigation*, BUSINESS WEEK, June 6, 1977, at 58.

TABLE 4

Tactics of Opponents in U.S. Environmental Conflict
(366 conflicts; 1970-78 scanning; % rounded off and means)

Categories and Conflict N	Regulatory		Private		Types of Opponent Tactics					Social	Number of Tactics Violence	Mean Number of Tactics Types
	Govt. Action	Legal Action	Govt. Action	Legal Action	Demonstration	Petition-Referenda	Press Lobbying	Campaign				
1. All U.S. Conflicts (366)	39%	64%	30%	18	4%	3%	8%	6%	1%	1.6		
All Foreign Conflicts (221)	18	73	18	16	6	16	22	3	1.7			
2. U.S. Location												
Northeast (121)	43	62	25	5	6	9	8	0	1.6			
Southeast (73)	36	65	31	3	1	10	4	0	1.5			
Midwest (55)	59	51	30	5	2	5	5	2	1.6			
Southwest (77)	16	77	28	4	2	4	4	2	1.4			
Far West (40)	38	69	47	0	0	9	9	3	1.8			
3. Type of Facility												
Petrochemical (18)	27	60	14	0	0	0	7	0	1.3			
Oil Refinery (29)	25	71	29	4	17	25	21	0	1.9			
Nonferrous Metal (22)	33	67	33	11	0	6	6	0	1.6			
Ferrous Metal (26)	74	70	9	0	0	0	0	0	1.5			
Pulp and Paper (22)	40	55	35	0	0	5	10	0	1.5			
Nuclear Power (40)	18	66	39	18	9	18	18	3	2.0			
Electric Utility (11)	30	60	50	10	0	10	0	0	1.6			
Transport and Storage (33)	25	68	43	4	4	11	14	7	1.8			
Mineral Mining (40)	31	69	38	3	0	16	0	0	1.6			
Inorganic Chemical (62)	44	68	26	2	2	2	0	0	1.4			
Organic Chemical (40)	49	69	29	0	0	0	3	0	1.5			
Other (23)	47	53	32	5	0	16	5	0	1.6			
4. Nature of Facility												
Existing (227)	50	60	27	2	1	2	2	1	1.4			
Expansion (14)	10	90	30	0	0	10	0	0	1.9			
New Proposal (125)	18	75	40	9	6	22	17	2	1.5			
5. Time of Emergence												
1970-71 (124)	54	53	26	2	2	6	6	1	1.5			
1972-73 (88)	39	67	23	3	1	6	1	0	1.4			
1974-75 (73)	26	71	38	2	3	7	3	2	1.5			
1976-78 (81)	26	70	34	7	4	4	5	0	1.5			

is naturally also stimulated by the orgiastic growth of complex and often deliberately ambiguous regulations, as well as by the legal profession itself. The traditions of adversarial politics and single-issue thinking are also deeply embedded. But litigiousness serves many positive functions. Note, for example, that violence has been three times, and mass demonstrations four times, as frequent abroad as compared to the United States. The tactics of opponents in Western Europe, particularly of anti-nuclear activists, have often been quite flamboyant and/or violent—extended plant site occupations in France, West Germany, and Switzerland; bombings and sabotage of plants, construction equipment, and high tension lines; terrorist attacks on executives of polluting corporations and officials of lax government agencies; and massive demonstrations, at times involving up to 50,000 protesters, led by a belligerent new breed of roving European “ecology troopers.”¹⁴ These kinds of tactics perhaps reflect high levels of frustration resulting from exclusionary political and corporate decision making processes, as well as the relative absence of means to redress grievances effectively.

Table 4 shows that different types of tactics have been utilized by opponents in different conflict situations. Governmental legal actions, for example, were employed in 74 percent of the ferrous metal conflicts—a figure almost twice the national average. Governmental administrative actions occurred in at least one-half of the cases in each facility category. The Far West, where groups such as the Sierra Club and Friends of the Earth have their headquarters, exhibited much higher use of private legal action (47 percent of all battles) as compared to the national average (30 percent). Demonstrations were found to be most frequent in the nuclear power sector (e.g., those orchestrated by the Clamshell Alliance in 1976-77 at the construction site of the controversial Seabrook, New Hampshire, nuclear power plant). The use of petitions and referenda was highly concentrated in the oil refinery sector, primarily in many of the ill-fated attempts to establish refineries along the coasts of states in New England with strong “home-rule” traditions. Opponents took their grievances directly to politicians, government bureaucrats, business executives, and/or corporate shareholders in the form of lobbying, particularly in the oil refining, nuclear power, and mining

14. See *Whither Now the Ecolos?* VISION, March 1979, at 29; Spivak, *Nuclear Power Plans Unchanged in Europe Despite Rising Protests*, Wall St. J., April 3, 1979, at 6; Fernex, *Non-Violence Triumphant*, 5 THE ECOLOGIST 372 (1975); *Plump and Einfallstos*, MANAGER MAGAZINE, July 7, 1975, at 24; *Don't Tell Us Nuclear Power is Safe, We Don't Like It*, THE ECONOMIST, November 13, 1976, at 63.

industries. Numerous firms, for example, have had to contend with proxy resolutions on environmental questions submitted by citizen lobbies for votes at shareholder meetings. Vigorous press campaigns have also been confronted. The long and acrimonious battle between Shell Oil and groups in Delaware over plans for an oil refinery is one case where a high-volume press campaign, with the slogan of "To Hell With Shell," won the day. Finally, it should be noted that violence or "ecological terrorism" has not been entirely absent from the U.S. environmental scene. The sabotage bombings of the Alaska oil pipeline and felled powerline transmission towers in a number of states are cases in point.

Existing facility disputes have largely attracted regulatory tactics, while new proposals have garnered the bulk of social tactics. The key pattern on the regulatory side is that:

Environmental conflict is increasingly characterized by governmental administrative rather than legal action—the discretionary powers of government bureaucrats appear to have greatly expanded in the 1970s.

Perhaps the two most important time trends presented in Table 4 are the dramatic decline of governmental legal actions (54 percent to 26 percent) and the gradually rising role of governmental administrative actions (53 percent to 70 percent). The amount of government-initiated litigation linked to environmental regulations promulgated in the late 1960s and early 1970s has apparently leveled off, while the scope of discretionary action on the part of administrative agencies has widened. Other trends to note are the growing frequencies of private legal action, demonstrations, and petitions/referenda—all mainly employed by public interest groups in their efforts to delay, modify, or block new industrial projects.

The Resolution Mechanisms

Various methods of dispute settlement (or termination) have been employed in the field of environmental conflict. The use of nine different resolution mechanisms was observed and coded in our study. They can be grouped into a smaller number of categories based on the relative amount of external participation in the resolution process: such outside intervention was at a maximum level when *public resolution mechanisms* (i.e., legislation, vote, public hearing) were employed; moderate level when traditional *third party resolution mechanisms* (i.e., autocratic governmental decision, adjudication, arbitration/mediation) were utilized; and very low level when

private resolution mechanisms (i.e., bargaining/negotiation, joint problem-solving, private decision) were relied upon. Many of the battles in our sample involved only one of the nine mechanisms, but others involved two or more of them in sequential or simultaneous combination.

Much attention has recently been focused in the United States on ways in which the resolution of environmental conflicts might be made more "constructive" (i.e., fairer, faster, less costly, more sensible, more certain, etc.).¹⁵ A serious national effort to bring about greater use of mediation and closely related techniques in resolving conflicts has been spearheaded by such organizations as RESOLVE (Center for Environmental Conflict Resolution), the American Arbitration Association, the Office of Environmental Mediation at the University of Washington, the Rocky Mountain Center on Environment, and the Environmental Mediation Project at the Wisconsin Center for Public Policy.¹⁶ But even the most avid proponents of mediation acknowledge that it is not a panacea. The notion that there is "no one best way" to manage environmental disputes has begun to gain wide acceptance.

The focus, therefore, must be on contingencies which combine to suggest the most appropriate mechanisms of conflict management in particular situations. The notion of "appropriateness," of course, frequently depends on whether a private or a public policy perspective is involved, and on whether it is defined in terms of the outcomes of environmental conflict, the processes of conflict resolution, or both.¹⁷ The character of environmental conflicts naturally varies

15. Gladwin, *supra* note 1.

16. See P. BALDWIN, ENVIRONMENTAL MEDIATION: AN EFFECTIVE ALTERNATIVE? (1978); RESOLVE, SELECTED READINGS IN ENVIRONMENTAL CONFLICT RESOLUTION (1978); M. RIVKIN, NEGOTIATED DEVELOPMENT (1977); Carpenter & Kennedy, *Information Sharing and Conciliation: Tools for Environmental Conflict Management*, ENVT'L COM., May 1977, at 21; Clark, *Consensus Building: Mediating Energy, Environmental, and Economic Conflict*, ENVT'L COM., May 1977, at 9; Cormick, *Mediating Environmental Controversies: Perspective and First Experience*, 2 EARTH L.J. 215 (1976); Cormick & Patton, *Environmental Mediation: Potentials and Limitations*, ENVT'L COM., May 1977, at 13; various issues of ENVIRONMENTAL CONSENSUS (published by RESOLVE, Center for Environmental Conflict Resolution); Greenburg & Straus, *Up-Front Resolution of Environmental and Economic Disputes*, ENVT'L COM., May 1977, at 16; McCarthy, *Resolving Environmental Conflicts*, 10 ENVT'L SCIENCE & TECHNOLOGY 40 (1976); O'Connor, *Environmental Mediation: The State-of-the-Art*, 2 EIA REV. (October 1978); *Removing the Rancor from Tough Disputes*, BUSINESS WEEK, August 30, 1976, at 50; Straus, *Mediating Environmental, Energy and Economic Trade-Offs*, 32 ARBITRATION J. 96 (1977); Susskind, *It's Time to Shift Our Attention from Impact Assessment to Strategies for Resolving Environmental Disputes*, 1978 EIA REVIEW 4; Gladwin, *supra* note 1.

17. *Id.* See also J. THIBAUT & L. WALKER, PROCEDURAL JUSTICE: A PSYCHOLOGICAL ANALYSIS (1975).

widely from case to case in regard to *situational features* and *decisional demands*. The characteristics of resolution mechanisms available also differ widely in regard to their *operating capabilities* and *resource requirements*. Constructive conflict resolution can thus be viewed as a function of the match or fit between procedure and dispute. The currently popular idea of mediation, for example, may best or perhaps only be suited for disputes reflecting low conflict of interest, a sense of shared goals, an absence of precedents at stake, relatively equal distribution of power, a relative lack of time pressure, a common interest in finding the "correct" or "best" solution, an acceptance of each party's legitimacy, issues which are relatively concrete, tangible, non-ideological, and negotiable, and a mature phase of conflict.¹⁸ Mediation, in other words, may be appropriate or feasible in only a very small share of the nation's environmental disputes.

Table 5 provides data on the resolution mechanisms that were employed in the environmental disputes included in our sample. Courtroom adjudication was the most frequently used mechanism in the United States (46 percent of all cases), while autocratic government decision-making played a role in three-tenths of the disputes. Public hearings, bargaining, joint problem-solving, private decisions, and legislation were each evident in at least 10 percent of the battles. The least-used mechanisms were voting and arbitration/mediation. Third-party mechanisms have thus clearly dominated the U.S. scene, with public and private mechanisms each employed in only half as many cases.

In a fashion similar to what we found in regard to issues, opponents, and tactics above, the use of different resolution mechanisms varied according to location, type, and nature of facility. For example, unilateral decisions by government bureaucrats in such forms as sanctioning an environmental impact statement, authorizing a development, or approving a plan for regulatory compliance were evident in 30 percent of all the U.S. conflicts, but they were employed in nearly two-thirds of the disputes in the highly regulated electric utilities sector. Adjudication, often in the form of protracted litigation, was resorted to in six out of every ten battles over nonferrous and ferrous metal facilities (e.g., the long and bitter disputes between the EPA and such steel firms as U.S. Steel, Bethlehem Steel, Jones & Laughlin Steel, Republic Steel, National Steel, and Wheeling-

18. Gladwin, *supra* note 1. See also BALDWIN, *supra* note 16; Cormick & Patton, *supra* note 16; S. Mernitz, *Mediation of Environmental Disputes: An Evaluation of Its Potential and Its Geographic Aspects* (doctoral dissertation at the University of Wisconsin-Madison, 1978).

TABLE 3
Resolution Mechanisms Used in U.S. Environmental Conflict
(366 conflicts; 1970-78 scanning; % rounded off and means)

Categories and Conflict N	Types of Resolution Mechanisms										Private	Mean Number of Resolution Mechanism Types
	Third Party			Public				Private				
	Auto- cratic Govt. Decision	Adjudi- cation	Arbitration/ Mediation	Legis- lation	Vote	Hearing	Public Negotiation	Bargaining/ Negotiation	Joint Problem Solving	Private Decision		
1. All U.S. Conflicts (366)	30%	46%	1%	10%	6%	19%	13%	14%	11%	1.5		
All Foreign Conflicts (221)	46	17	2	5	2	23	24	10	22	1.9		
2. U.S. Location												
Northeast (121)	33	43	0	9	9	26	14	17	9	1.6		
Southeast (73)	24	48	2	4	4	18	13	16	14	1.4		
Midwest (55)	22	69	4	13	4	9	7	20	11	1.6		
Southwest (77)	33	30	0	7	6	20	13	6	16	1.3		
Far West (40)	38	50	3	22	0	19	16	13	9	1.7		
3. Types of Facility												
Petrochemical (18)	23	39	0	8	15	23	8	0	8	1.2		
Oil Refinery (29)	38	21	0	8	21	38	17	21	13	1.8		
Nonferrous Metal (22)	17	61	0	0	0	28	28	28	11	1.7		
Ferrous Metal (26)	32	59	0	5	0	9	32	9	5	1.5		
Pulp and Paper (22)	13	50	0	0	0	13	13	31	19	1.4		
Nuclear Power (40)	42	45	3	21	21	24	0	3	10	1.7		
Electric Power (11)	63	50	0	0	0	13	13	13	13	1.6		
Transport and Storage (33)	18	46	4	39	11	50	18	4	7	2.0		
Mineral Mining (40)	30	40	3	7	3	7	17	13	20	1.4		
Inorganic Chemical (62)	27	42	0	2	2	13	10	21	23	1.4		
Organic Chemical (40)	38	45	3	10	0	14	14	21	7	1.5		
Other (23)	47	41	0	6	0	18	0	6	6	1.2		
4. Nature of Facility												
Existing (227)	29	52	1	6	2	10	13	17	12	1.4		
Expansion (14)	40	30	0	0	0	50	20	10	0	1.7		
New Proposal (125)	34	36	2	19	13	35	12	10	12			
5. Time of Emergence												
1970-71 (124)	25	55	0	6	2	11	5	12	15	1.3		
1972-73 (88)	33	44	3	10	5	16	18	16	14	1.6		
1974-75 (73)	24	42	2	12	6	24	14	18	0	1.5		
1976-78 (81)	41	36	2	9	11	27	18	11	5	1.6		

Pittsburgh Steel over their polluting facilities in states such as Pennsylvania, Ohio, and West Virginia). Other forms of third-party intervention, such as arbitration and mediation, were very rarely utilized in the kinds of industrial facility disputes included in our survey.

The most common public resolution mechanisms involved were public hearings or inquiries, employed most frequently in oil refinery and transport and storage facility battles, particularly in the Northeast. Legislation, at local, regional, and national levels, was called into play in helping to resolve 10 percent of all the conflicts, but significantly higher shares of the Far West, nuclear power, and transport and storage disputes (e.g., the Clinch River fast breeder reactor project and the Alaskan oil pipeline). Citizen voting was also resorted to in those two sectors, as well as in cases of petrochemical plants and oil refineries.

Direct bargaining and negotiation among the disputing parties, unassisted by third parties, was employed in 13 percent of all the battles in the sample, but was evidenced in nearly one-third of all the nonferrous and ferrous metal disputes. Joint problem solving only transpired in 14 percent of the cases as a whole, but was more frequent in a number of sectors. Examples drawn from the mineral mining sector would include the "Experiment in Ecology" launched by AMAX in the planning of its Henderson, Colorado, molybdenum mine in the late 1960s and the same firm's agreement to participate in a joint review effort called the "Colorado Review Process" with regard to the planning of another molybdenum mining project near Crested Butte, Colorado, in the late 1970s. Both experiences, by opening up the planning process and bringing together people with widely divergent views to work on a practical development problem, represent innovative harmonizing approaches to environmental conflict management. Finally, private decisions, typically in the form of a corporation unilaterally deciding to shut down a facility or cancel a new project, were the way in which 11 percent of the disputes were terminated; about one-fifth of the pulp and paper, mineral mining, and inorganic chemical facility conflicts were handled in this way.

Table 5 also shows that:

Environmental conflict is moving out of the courts—the relative amount of courtroom adjudication involving industrial facilities seems to be decreasing, while other resolution mechanisms such as voting, public hearings, and autocratic governmental decision making are on the rise.

We have recently witnessed a rise in (a) autocratic decision

making, perhaps reflecting the stronger discretionary powers vested in administrative agencies; (b) citizen voting, indicating a rise in single-issue politics and perhaps a widening gulf between elected representatives and public opinion; and (c) public hearings, probably as a product of increased participatory activism and broadened acceptance of the notion of pre-project environmental impact assessment. Contrary to popular impressions, however, the relative amount of adjudication in U.S. industrial environmental disputes has been falling (from 55 percent in 1970-71 to 36 percent in 1976-78). The field of battle thus appears to be moving from the courtroom to the hallways of government agencies, town hall meeting rooms, and local ballot boxes.

The data on the number of different resolution mechanisms utilized per battle in Table 5, along with trends noted previously, indicates another important pattern:

Environmental conflict is growing in size—the average number of issues, opponents, and resolution mechanisms involved per battle is increasing, in large measure as a consequence of other trends above (e.g., the shift from existing facilities to new projects).

Table 2 revealed a rise in the number of types of issues involved in the average environmental battle (1.6 in 1970-71 to 1.9 in 1976-78), reflecting an expansion in the range of environmental impacts of concern to citizens. Table 3 indicated a rise in the number of opponent types per conflict (1.9 in 1970-71 to 2.1 in 1976-78) as a consequence of increased involvement on the part of local residents and governments. And Table 5 shows that an average of 1.3 resolution mechanisms were employed per battle in 1970-71. The figure in 1976-78, however, was 1.6, in part reflecting the increased use of public mechanisms as noted above. Shifting patterns in facility location, nature, and type also underlie these trends. Environmental battles in the Far West, for example, have led the nation in the number of opponents involved, tactics utilized, resolution mechanisms employed, and amount of time consumed (see Table 6 below). Likewise, conflicts over expansions and new proposals have entailed a significantly broader range of issues, opponents, tactics, and resolution mechanisms than disputes over existing facilities.

As one might expect, most of the conflict size variables mentioned above were found to be closely associated. A correlation analysis, for example, found that the number of opponents in a battle was strongly and positively associated with the number of issues (a zero-order correlation, significant at the .01 level, of .50), tactics (.63),

and resolution mechanisms (.52) involved in the dispute, as well as its duration (.51).¹⁹ This may suggest that the wider and deeper the environmental impacts of an industrial facility (i.e., the more varied the issues), the more numerous and diverse the actors which emerge in opposition and the tactics which they correspondingly bring to bear against the firm. The resulting complexity may, in turn, necessitate the use of more methods of conflict resolution. And channeling conflicts sequentially or simultaneously through a greater range of resolution mechanisms may thus eat up more time, lengthening the duration of the dispute.

The Outcomes and Durations

We now come to the outcomes of the environmental battles. As of the mid-1978 closing date of our survey, more than 40 percent of the sample conflicts were still ongoing. The data in Table 6 thus reflects intermediate outcomes reported for unresolved conflicts as well as both intermediate and final outcomes for disputes fully terminated or resolved. Final and/or intermediate outcomes were reported for 80 percent of the conflicts. The figures on duration, however, are limited to cases which had ended by the survey cut-off date.

For purposes of analysis, the outcomes of environmental conflict were grouped into three categories: (a) certain outcomes were generally of greater benefit to the *opponents* than to the corporations involved and would include fines and compensation, jail sentences, shutdowns and capacity reductions, blockages, and postponements; (b) other outcomes can be viewed as representing *compromises* offering partial satisfaction to each of the contesting parties and would include delays, facility modifications, and relocations; and (c) still other outcomes would generally indicate victory for the *corporation*, manifested in project approvals and establishments. The set of coded outcomes was thus limited to those which were tangible and of immediate consequence to the parties involved.

What determines the outcomes of environmental conflicts? The answer to this vital question is unfortunately not yet in hand on either a theoretical or an empirical basis. Whether a conflict ends in a clear victory for one side or a compromise obviously depends upon many aspects of the conflict process. Scholars have noted dozens of interacting variables which serve to shape the magnitude and distribution of conflict outcomes. Those shown in Table 6, for example, can

19. These measures for the interval scale data represent zero-order Pearson's product-moment correlations (ranging from -1 to +1) which assume symmetric and simple linear associations.

Outcomes and Duration of U.S. Environmental Conflict
(366 conflicts; 1970-78 scanning; % rounded off and means)

Categories and Conflict N	Opponent			Types of Outcomes				Corporate		Mean Duration of Conflict (years)	
	Fine or Compensation	Jail Sentence	Shutdown/Capacity Reduction	Blocked	Postponed	Delay	Technical Modification	Relocated	Approved		Establishment
1. All U.S. Conflicts (366)	16%	1%	19%	16%	2%	24%	36%	4%	22%	6%	1.8
All Foreign Conflicts (221)	13	2	19	18	4	32	39	14	22	9	1.5
2. U.S. Location											
Northeast (121)	22	2	13	18	1	14	47	7	17	7	1.8
Southeast (73)	16	0	18	11	0	24	28	4	22	4	1.4
Midwest (55)	17	0	29	6	0	23	43	0	17	6	1.8
Southwest (77)	15	0	26	16	8	23	28	5	23	7	1.7
Far West (40)	0	0	10	28	0	55	28	3	35	7	2.3
3. Type of Facility											
Petrochemical (18)	8	0	0	33	0	58	25	8	17	0	1.7
Oil Refinery (29)	20	0	5	50	5	10	25	25	15	0	1.6
Nonferrous Metal (22)	21	5	26	11	0	32	37	11	16	11	2.4
Ferrous Metal (26)	40	0	20	0	0	5	60	0	10	0	2.8
Pulp and Paper (22)	9	0	27	0	0	0	64	0	18	0	1.8
Nuclear Power (40)	4	4	20	20	0	36	20	0	44	8	1.4
Electric Utility (11)	11	0	0	44	0	44	33	0	0	0	2.0
Transport and Storage (33)	4	0	4	28	4	60	16	0	40	28	2.2
Mineral Mining (40)	3	0	24	14	14	48	17	0	28	10	1.4
Inorganic Chemical (62)	16	0	30	5	0	7	53	5	16	0	1.5
Organic Chemical (40)	42	0	42	5	0	0	47	5	0	5	1.8
Other (23)	15	0	8	23	0	23	39	8	31	8	1.2
4. Nature of Facility											
Existing (227)	26	1	28	3	0	5	50	1	13	3	1.8
Expansion (14)	0	0	11	33	0	33	22	0	33	0	1.8
New Proposal (125)	2	1	5	34	6	56	17	10	35	12	
5. Time of Emergence											
1970-71 (124)	19	0	20	12	1	11	43	4	10	1	1.9
1972-73 (88)	9	2	26	17	2	19	36	6	17	6	2.0
1974-75 (73)	12	0	12	19	2	33	26	0	33	2	1.7
1976-78 (81)	23	2	23	12	7	33	30	7	19	5	1.1

perhaps be traced to characteristics of the parties involved, nature and magnitude of the goals in contention, nature of the issues at stake, past and anticipated relationship between the parties, strategies and modes of conflict behavior engaged in, differential power or resources among the parties, presence and influence of audiences, availability and use of third parties, and character of the resolution mechanisms employed.

An overall impression drawn from the data in Table 6 is that:

Environmental conflict is becoming more costly—recently rising rates of fines/compensation and shutdowns in regard to existing facilities, and delays, postponements, and blockages with respect to new proposals, all translate into higher costs for industry. The costs of conflict over new proposals have generally been highest in the Far West.

Fines or compensation for damage were paid by corporations in 26 percent of the existing facility battles. Two well-known examples of this kind of outcome are General Electric's settlement of \$7 million for PCB research and waste-treatment facility construction that terminated the New York State Department of Environmental Conservation's proceedings against the company's PCB pollution of the Hudson River and Allied Chemical's \$20 million in fines, settlements, and donations related to its kepone ordeal at Hopewell, Virginia. 28 percent of the existing facility disputes ended with shutdowns or capacity reductions and 50 percent of such cases were resolved via technical modifications. Such "retrofitting" was especially prevalent in the ferrous metal battles in the Midwest—e.g., after years of emotionally fighting air and water cleanup regulations every inch of the way, U.S. Steel chose in 1978 pragmatically and comprehensively to negotiate its compliance with regulatory standards with the EPA. Twelve months of intensive negotiations between teams of U.S. Steel and EPA officials resulted in a 193-page landmark agreement in 1979 calling for the company to spend about \$400 million on air and water pollution control projects—reportedly adding about \$25 per ton to the cost of producing steel by the end of 1982.

The economic costs of conflicts over new proposals have also been staggering: 56 percent of such projects encountered substantial delay, while 10 percent of them were relocated, 6 percent postponed, and 34 percent blocked entirely. Delays of at least a half year due to environmental opposition were most pervasive in the mining, petrochemical, and transport and storage sectors; typical cases in the latter include proposals by the Louisiana Offshore Oil Port Authority for a \$500-million deepwater port, Western LNG Associates for an

LNG import terminal and storage facility at Port Conception, and Sohio for an oil import terminal at Long Beach, California. Fifty-five percent of all the battles in the Far West entailed significant delays for the firms involved; this helps to explain the recent emergence of an ABC (Anywhere but California) philosophy of industrial plant location. Site relocations, either attempted or realized, were most frequent in the oil refinery and nonferrous metal sectors (e.g., Shell leaving Delaware in order to find a refinery site or Alumax abandoning Oregon after a ten-year aluminum smelter siting saga). Project postponements related to problems of environmental acceptance were most frequent in the mineral mining sector in the Southwest (e.g., deferred plans for oil shale development in Colorado involving Occidental, Ashland, Gulf, Shell, and Standard Oil of Indiana). Finally, we should note that one-third of the new proposal cases were successfully blocked as a result of opponent efforts; 50 percent of the oil refinery battles ended in this manner (e.g., proposals of Atlantic Richfield, Occidental, Maine Clean Fuels, Olympic Refining, and many others in the New England region).

The aggregate cost of these kinds of conflict outcomes, while impossible to estimate accurately, has surely been in the many billions of dollars. And while the jury is still out on many of the battles which emerged in 1976-78, the trend data presented in Table 6, in general, indicates no lessening of the cost burden of environmental conflict.

The far right-hand column in Table 6 provides data on the mean duration of those conflicts emerging in the 1970s which had reportedly been resolved or terminated by mid-1978 (only about one-half of the total pool of conflicts in the sample). Durations were calculated for each case in terms of the number of years between the first point of significant controversy (as marked by opponents engaging in interference or resistance) and the last point of controversy (usually associated with a symbolically important event or an explicit agreement between the contending parties indicating a resolution or termination of the dispute). The mean duration for the completed U.S. cases was 1.8 years, with the range extending from one to eight years. The determinants of conflict duration are numerous. Some of the key variables include the number of issues at stake, level of difficulty of the issues, presence of intangible or symbolic issues, number of parties directly involved, absence of prior and anticipated future relationships among the parties, absence of time limits and third party intervention, accountability of the parties to a greater number of salient audiences, presence of misunderstanding, faulty communication and hostile attitudes, availability and use of threats,

high perceptions of stakes riding on the outcome, and involvement of competitively-oriented disputants of roughly equal power.²⁰ Such factors variously serve to deepen and broaden the conflict, increase the difficulty of coordination, and introduce barriers to the workings of resolution processes; thus they tend to increase the amount of time needed to resolve a dispute.

The duration data in Table 6, while heavily biased to the early and/or small and easily resolved disputes, reveals some interesting patterns. The Far West exhibited the longest mean duration of any region in the United States, while battles in the Southeast, where the environmental movement is probably weakest, showed the shortest average duration. Nonferrous metal, ferrous metal, and transport and storage sector conflicts lasted longer on average as compared to those in other sectors. (Note that many of the large-scale electric utility, nuclear power, and minerals mining conflicts are not yet resolved and thus did not enter into their sector's calculations.) Without the benefit of duration data on many of the disputes which emerged in 1976-78, it is difficult to tell whether conflicts today are being processed more or less quickly than those which erupted in the earlier part of the decade. Corporate and societal learning, along with institutionalization of dispute resolution processes, however, should be working to reduce the average duration of environmental conflict.

Whither Environmental Conflict?

Where does environmental conflict over industrial facilities, and by implication the fighting arm of the environmental movement, appear to be headed? The 12 patterns already highlighted have noted some specifics, but a summary view can also be offered. Using the composite variables introduced in each section above (e.g., the *issues* were classified into two composite categories, *primary* and *secondary*), a correlation analysis was conducted to examine relationships between all pairs of such composites on issues, opponents, tactics, resolution mechanisms, and outcomes involved in environmental conflict.²¹ We found, for example, that the role of non-governmental opponents (i.e., the "environmental movement" as it has traditionally been known) in environmental conflict in the 1970s could be characterized as follows. Such opponents were most often found to be involved in later rather than earlier disputes, active in battles over new proposals rather than existing plants, concerned with primary rather than secondary issues, local rather than non-local

20. See note 9 *supra*.

21. Results of this correlation analysis can be obtained by writing to the author.

in origin, enmeshed in larger rather than smaller coalitions, employing social rather than regulatory tactics, displaying a broader range of tactics than governmental opponents, participating in public rather than third party or private resolution mechanisms, and scoring less clear-cut victories than the corporations.

We also discovered this overall pattern:

Environmental conflict is shifting from "regulatory" to "social" in general character—as such the "environmental movement" is assuming an ever more central role in the process.

A formal factor analysis confirmed that many of the composite variables, particularly in regard to opponents, tactics, and resolution mechanisms, fall into clusters corresponding to two distinct types of environmental conflict. One seems to represent "social conflict," and the other might be described as "regulatory conflict." Table 7 shows the nature of the two clusters. Each includes items which were found to be more highly intercorrelated with each other in their own column than they were with items in the other.

TABLE 7

Types of Environmental Conflict

	<i>"Social Conflict"</i>	<i>"Regulatory Conflict"</i>
Types of Issues:	Primary (and Secondary)	Secondary (and Primary)
Number of Issues:	Higher	Lower
Types of Opponents:	Nongovernmental and Local	Governmental and Non-Local
Number of Opponents:	Higher	Lower
Types of Tactics:	Social	Regulatory
Number of Tactics:	Higher	Lower
Types of Resolution Mechanisms:	Public and Private	Third Party and Private
Number of Resolution Mechanisms:	Higher	Lower
Types of Outcomes:	Compromise, Opponent and Corporate	Opponent and Compromise
Facility Nature:	New Proposals and Expansions	Existing Facilities and Expansions
Time of Emergence:	Later	Earlier
Duration:	Longer	Shorter

The two types of conflict can be distinguished as follows. Primary issues (e.g., health and safety, economic and social impact) of deep concern to non-governmental and local opponents tend to be most prominent in social conflict, while governmental and non-local opponents mainly concerned with secondary issues of environmental

quality (e.g., air and water pollution) tend to be more prevalent in regulatory conflict. Social conflict tactics such as demonstrations, lobbying, and press campaigns confront firms planning new proposals, while governmental legal and administrative actions as applied to existing facilities characterize regulatory conflict. Social conflicts tend to encompass more issues, opponents, tactics, and resolution mechanisms than the regulatory variety. And the two types are dealt with in different ways—public resolution mechanisms are almost exclusively found in social conflict, while third-party mechanisms are mainly employed in regulatory disputes. Compromise and opponent outcomes appear to result in both types of disputes, but corporations generally fail to win regulatory battles, although they have better luck in the social ones. Finally, social conflicts have emerged more recently, and typically have lasted longer, than the regulatory kind.

Our survey has focused on the 1970s. But the trends suggest that the country may be entering an even more difficult era in which growing demands and diminishing resources will increase the frequency and intensity of the “social” breed of environmental conflict. Yet it is evident from many recent episodes that we still know little about how to cope with such conflict in equitable and efficient ways. The urgent task confronting us all as we move into the 1980s is to develop and apply more systematic knowledge about constructive conflict management.