

INSTITUTIONAL EVOLUTION AND CHANGE: ENVIRONMENTALISM AND THE U.S. CHEMICAL INDUSTRY

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This study measured changes in the constituency of an organizational field centered around the issue of corporate environmentalism in the period 1960-93, correlating those changes with the institutions adopted by the U.S. chemical industry to interpret the issue. The article develops the ideas that fields form around issues, not markets or technologies; within fields, competing institutions may simultaneously exist; as institutions evolve, connections between their regulative, normative, and cognitive aspects arise; and field-level analyses can reveal the cultural and institutional origins of organizational impacts on the natural environment.

Institutional theory directs attention toward forces that lie beyond the organizational boundary, in the realm of social processes (DiMaggio & Powell, 1991; Scott, 1995). A firm's action is seen not as a choice among an unlimited array of possibilities determined by purely internal arrangements, but rather as a choice among a narrowly defined set of legitimate options determined by the group of actors composing the firm's *organizational field* (Scott, 1991). The form of this influence is manifested in *institutions*: rules, norms, and beliefs that describe reality for the organization, explaining what is and what is not, what can be acted upon and what cannot. Institutional theory, in short, asks questions about how social choices are shaped, mediated, and channeled by the institutional environment.

One enduring criticism of neoinstitutional theory has been its failure to adequately address the concept of change (Brint & Karabel, 1991; DiMaggio, 1988; Hirsch, 1997; Hirsch & Lounsbury, 1997). Institutions create powerful pressures for organizations to seek legitimacy and strive for social conformity (Orri, Biggart, & Hamilton, 1991). Therefore, analysts have typically found institutional phenomena reflected in an increasing homogeneity of organizations (Kraatz & Zajac, 1996). But this focus on "isomorphism" (DiMaggio & Powell, 1983) facilitates a popular misconception of the theory as

having only stability and inertia as its central defining characteristics (DiMaggio, 1995; Greenwood & Hinings, 1996). In this article, I attempt to correct this misconception by reintroducing the "old" institutional concept of change into the neoinstitutional literature (Greenwood & Hinings, 1996; Hirsch & Lounsbury, 1997; Holm, 1995; Kraatz & Zajac, 1996).

Specifically, this article builds a framework for understanding how organizational fields and institutions coevolve. Through a longitudinal analysis, I empirically measured changes in the constituency of an organizational field centered around the issue of corporate environmentalism from 1960 to 1993 and correlated those changes with the evolving institutions adopted by the U.S. chemical industry to interpret and make sense of the issue. The notion that an organizational field forms around a central issue—such as the protection of the natural environment—rather than a central technology or market introduces the idea that fields become centers of debates in which competing interests negotiate over issue interpretation. As a result, competing institutions may lie within individual populations (or classes of constituencies) that inhabit a field, becoming *situated institutions*. Field formation is not a static process; new forms of debate emerge in the wake of triggering events that cause a reconfiguration of field membership and/or interaction patterns. This notion that events alter social arrangements has received some support from other studies of organizational change (Meyer, 1982; Meyer, Brooks, & Goes, 1990). The analysis is also built on the idea that institutional evolution involves transitions among three aspects of institutions, which Scott (1995) called *pillars*: the regulative, normative, and cognitive. Institutions comprise all three aspects (Hoffman & Ventresca, 1999).

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One aspect may be dominant at any given time, but the three coexist and are interconnected (Hirsch, 1997). In the end, this framework describes the social dynamics by which field-level debate forms around defining the meaning of corporate environmentalism and how that debate evolves over time as the field-level constituency is reconfigured and the dominant meanings and interpretations change (Jennings & Zandbergen, 1995). The remainder of this section will be devoted to defining the three central constructs of this article—the organizational field, institutions, and disruptive events.

CENTRAL CONSTRUCTS

Organizational Fields

Strictly speaking, an organizational field is “a community of organizations that partakes of a common meaning system and whose participants interact more frequently and fatefully with one another than with actors outside the field” (Scott, 1995: 56). It may include constituents such as the government, critical exchange partners, sources of funding, professional and trade associations, special interest groups, and the general public—any actor that imposes a coercive, normative, or cognitive influence on a given focal organization or population of organizations (Scott, 1991).

But more than just a collection of influential organizations, a field is the center of common channels of dialogue and discussion. This important clarification leads to a conception of organizational fields that diverges from that dominant in the literature. A field is not formed around common technologies or common industries, but around issues that bring together various field constituents with disparate purposes. Not all constituents may realize an impact on the resulting debate, but they are often armed with opposing perspectives rather than with common rhetorics. The process may more resemble institutional war (White, 1992) than isomorphic dialogue. Thus, it is important to distinguish between an organizational field and individual populations within it, or “classes of organizations that are relatively homogenous in terms of environmental vulnerability” (Hannan & Freeman, 1977: 166). For example, although environmentalists and chemical manufacturers may occupy a common organizational field through which they influence one another, it would be incorrect to assume that they share the same beliefs and attitudes toward the environment.

The presence of a field structure should be analytically detected not through observing the emer-

gence of a tangible pattern of organizational coalitions, but through observing (1) an increase in the extent to which certain organizations interact, (2) an increase in the information load they share, and (3) the development of a mutual awareness that they are involved in a common debate (DiMaggio, 1983). Where some may define a field around companies with a common product or market (as bounded, for instance, by a Standard Industrial Classification [SIC] code), I suggest that a field is formed around the issues that become important to the interests and objectives of a specific collective of organizations. Issues define what the field is, making links that may not have previously been present. Organizations can make claims about being or not being part of the field, but their membership is defined through social interaction patterns. Conceptualizing a field as centered around issues rather than networks reveals greater complexity in field formation and evolution. If an organization or population chooses to disregard an emerging issue, others may crystallize the field formation process for them. For example, chemical producers denied the importance of the book *Silent Spring* in 1962, but they were forced into field-level dialogue with government agencies, scientific organizations, and conservation groups over issues of pesticide toxicity. Field membership may also be for a finite time period, coinciding with an issue's emergence, growth, and decline. For example, in 1979 residents of Love Canal, New York, became influential in shaping perceptions and beliefs about abandoned hazardous waste sites when 20,000 tons of chemical wastes were discovered beneath their homes. Yet, as the remediation efforts began and the issue subsided, so did their influence.

Institutions and Situated Institutions

Organizational fields become “arenas of power relations” (Brint & Karabel, 1991: 355) where multiple field constituents compete over the definition of issues and the form of institutions that will guide organizational behavior. Institutional beliefs and perceptions are influenced by this field-level competition but are situated within individual organizations or populations of organizations. Therefore, to fully appreciate the complexity of institutional dynamics, one must analyze both the specific institutions that lie at the center of an issue-based field and the competing institutions that may lie within the individual populations (or classes of constituencies) that inhabit that field.

Institutional influences on organizational behavior can take several forms, but taken together they guide the interpretation of issues as they emerge

and persist. As noted above, Scott (1995) argued that institutions have three aspects, which he called pillars: the regulative, the normative, and the cognitive. *Regulative* (or legal) aspects of institutions most commonly take the form of regulations. They guide organizational action and perspectives by coercion or threat of legal sanctions. Organizations accede to them for reasons of expedience, preferring not to suffer the penalty for noncompliance. For example, corporations adopt new pollution control technologies to conform to environmental regulations, and nonprofits maintain accounts and hire accountants in order to meet tax law requirements (DiMaggio & Powell, 1983). In responding to a regulative institution, one might ask, What are my interests in this situation? (March, 1981). *Normative* (or social) aspects of institutions generally take the form of rules-of-thumb, standard operating procedures, occupational standards, and educational curricula. Their ability to guide organizational action and beliefs stems largely from social obligation or professionalization. Organizations will comply with them out of moral/ethical obligation or in conformance to norms established by universities, professional training institutions, and trade associations. In responding to a normative institution, one might ask, Given my role in this situation, what is expected of me? (March, 1981). *Cognitive* (or cultural) aspects of institutions embody symbols—words, signs, and gestures—as well as cultural rules and frameworks that guide understanding of the nature of reality and the frames through which that meaning is developed. Organizations will often abide by them without conscious thought (Zucker, 1983). Cognitive institutional aspects form a culturally supported and conceptually correct basis of legitimacy that becomes unquestioned. For example, it is regarded as natural that environmental activists pursue idealistic or collectivist interests, whereas corporations pursue economic and materialistic goals. These beliefs are taken-for-granted. Together, the three pillars structure how important issues are perceived and appropriate actions are developed (Fligstein, 1992).

Institutional Evolution and Disruptive Events

In most depictions of institutional processes, once organizational fields and guiding institutions are defined, the forces that drive organizations toward inertia and isomorphism are described. Stability is one aspect of the institutional environment, but this article is an attempt to identify how these forces change. First, the organizational field should be seen, not as static, but as evolving

through the entry and the exit of particular organizations or populations (Barnett & Carroll, 1993) and/or through alteration of the interaction patterns and power balances among them (Brint & Karabel, 1991; Greenwood & Hinings, 1996). Second, with an alteration of the field configuration comes an alteration of the corresponding institutions, which are redefined at the field and population levels through political negotiation to reflect the interests of the newly formed field (Oliver, 1991).

To this last point, there is some dissension within the literature as to how the three aspects of institutions might evolve and change. Scott (1995) depicted the regulative, normative, and cognitive institutional pillars as analytically independent and self-contained. Coevolution or interaction would not be expected. Hirsch countered that such a notion “seriously weakens the power of this otherwise intriguing and creative new typology” (1997: 1709). In the latter view, the institutional pillars are not analytically and operationally distinct but rather, overlapping, so that development of one aspect will influence the development of other aspects. This article’s analysis of evolving institutions will shed some light on this debate.

One final issue to consider in the institutional change process is that of the initiating event, or trigger. In this article I consider the possibility that disruptive events can sharply end what has become locked in by institutional inertia (White, 1992). Various referred to as shocks (Fligstein, 1991), jolts (Meyer, 1982), or discontinuities (Lorange, Scott Morton, & Ghoshal, 1986), such events can take multiple forms. Hannigan identified three types: “milestones (e.g., Earth Day, the Rio Summit); catastrophes (e.g., oil spills, nuclear accidents, toxic fires); and legal/administrative happenings (e.g., parliamentary hearings, trials, release of environmental white papers)” (1995: 64). Which ever form they take, disruptive events have been central in explanations of change processes on various organizational levels. They have been described as creating disruptive uncertainty for individual organizations, forcing the initiation of unorthodox experiments that diverge from established practice (Meyer, 1982). They have also been described as throwing entire industries into the throes of quantum change, causing a restructuring process by the relocation of industry boundaries and an alteration of the bases of competition (Meyer et al., 1990). In similar fashion, this article identifies triggering events that may have caused a reconfiguration of an organizational field and the institutions that guide behavior.

ENVIRONMENTALISM AND THE U.S. CHEMICAL INDUSTRY

Since the early 1960s, there has been a continual redefinition of corporate environmental practice within U.S. industry. In the course of this 34-year span, there have been rapid structural, technical, and cultural changes in corporate behavior. For example, in the 1970s, attempts to control pollution at industrial facilities focused on "end-of-pipe" treatments. In the 1980s, attention shifted toward waste minimization and pollution prevention in the production process. In the 1990s, attention shifted yet again to include concern for product stewardship and life-cycle analysis, leading industries to reduce pollution by altering raw material and product choices. In the coming decade, conceptions of environmental protection may center on concern for sustainable development (Gladwin, Kennelly, & Krause, 1995; Hart, 1997).

Throughout this period, one industry that has continually been at the center of the evolving environmental issue has been the U.S. chemical industry; it was the principal villain in *Silent Spring* and the target of most early and many more recent Environmental Protection Agency (EPA) regulations controlling industrial pollution, and it is a central contributor to such contemporary problems as climate change and acid rain. This industry has been singled out in public opinion polls as the preeminent environmental threat from the 1970s (Erskine, 1971) through the 1990s (Cambridge Reports/Research International, 1992). The volume of the industry's waste streams exceeds that of the second most polluting industry sector (primary metals) by a factor of more than two (U.S. Environmental Protection Agency, 1992). By 1992, the chemical industry devoted nearly 10 percent of its capital expenditures to environmental compliance; in comparison, the average for all industries was under 2 percent (U.S. Department of Commerce, 1973-92).

Because of the pressure and scrutiny accompanying this industry's special position, environmental concerns emerged earlier and developed with more intensity within it than they did in other, less controversial industries. Therefore, I expected that the history of chemical industry environmentalism would be richer and more developed than those of other industries, making it an ideal candidate for study. The chemical industry met the criteria for an "extreme case," one in which the process of theoretical interest was more transparent than it would be in other cases (Dutton & Dukerich, 1991; Eisenhardt, 1989). As such, it seemed it would enable valuable contributions both in elaborating institu-

tional theory and in providing insights into the substantive topic of management of the natural environment.

METHODS AND DATA

My objectives in this research were to capture longitudinal data regarding the evolution of three central variables over the period 1960-93: (1) the organizational field, for which the key question was, Who was relevant in defining legitimate environmental action for U.S. industry? (2) situated institutions, and the question, How was the environmental issue framed and defined within the population of U.S. chemical manufacturers inhabiting the field?¹ and (3) disruptive events, and the question, What events were present at shifting points in the field or institutions? To capture these variables, I analyzed two independent data sources and used two different methodologies. Statistical analysis of federal legal cases was used to detect organizational field constituency. Content analysis of the trade journal *Chemical Week* was used both to characterize shifts in chemical industry conceptions of the environmental issue and to expose disruptive events that may have driven those shifts. The benefits of using two distinct and independent sources of data to build this analysis lay in the added credibility gained from their corroborating support for the composite model developed (Jick, 1979). Below, I discuss each data source individually.

Federal Legal Cases

To capture field formation around environmentalism, I measured participation in federal lawsuits concerning the issue. In the legal analysis, cases involving all industries, not the chemical industry alone, were included. Legal activity is a visible manifestation of the relevant actors in an organizational field. Who is authorized to participate in the legal process reflects who has a voice in determining institutional norms. Law has a direct impact on corporate action and reveals which players are relevant in determining such action by providing a formal system within which actors can influence each other. Records of legal cases provide, admit-

¹ In this study, U.S. chemical manufacturers are not defined strictly as the 2,838 companies that fall under SIC code 28. Rather, this population was empirically bounded by my choice of data source and was thus companies representing the readership of *Chemical Week*.

tedly, an incomplete inventory, limiting observations to those actors that employ legal channels to influence corporate behavior. Constituents who exert institutional influence through other, less confrontational, channels are left out. But legal data provided one reasonable proxy for the focal field's measurement. Although subject to the errors just mentioned, it is a construction of the field based on who is found to have meaning to the field's membership (Bourdieu & Wacquant, 1992; DiMaggio, 1991).

The Westlaw environmental law database contains documents strictly related to the issue of environmental protection from cases that were argued before the U.S. Supreme Court; federal courts of appeals, district courts, and bankruptcy courts; the Court of Federal Claims; the U.S. Tax Court; and military courts and related federal and territorial courts. I used each case filed with one of the courts listed as an individual data point. I used this database to identify both the emergence of new field members and the shifting interaction patterns among them, as revealed by the cases filed by and against the various constituents. I considered the outcomes of the individual cases to be of less importance than the broad constituencies represented in the aggregate.

Initially, I collected a total of 5,588 observations for the time period 1960–93. After duplicates were eliminated, the database numbered 3,572 observations. Plaintiffs and defendants were then classified by type. I found that 88 percent of the plaintiffs and defendants could be grouped into four types: industry organizations (companies, trade associations), government organizations (city, state, or federal), nongovernmental organizations, or NGOs (environmental groups, employee groups, community groups, Indian tribes), and insurance companies. The remaining cases represented individuals whose institutional affiliation could not be identified; these were excluded from further analysis in this study. The classified case data were then sorted and analyzed according to their respective populations. Field constituency was assessed as the presence of particular populations of actors in any given year. I used the entrance (or exit) of individual categories of actors into (out of) lawsuits and shifts in the direction of their lawsuit activity (from plaintiff to defendant or vice versa) to represent the evolving nature of the organizational field.

What I found was that the constituent make-up of those participating in legal activity evolved through four distinct stages. The timing of these stages was determined through two steps. First, several ranges of possible transition stages were identified through a review of several environmen-

tal history references (Gottlieb, 1993; Scheffer, 1991). I then used these ranges to focus attention on periods of expected shifts. For example, historical references suggested that an institutional shift might be noted between 1969 and 1971, aligning with the Santa Barbara oil spill, the Cuyahoga River fire, the first Earth Day, the passage of the National Environmental Policy Act, and the formation of the EPA. Similarly, another shift was expected between 1980 and 1985, the period of the passage of the Superfund (the Comprehensive Environmental Response, Compensation, and Liability Act), the administration of Ronald Reagan, the Times Beach evacuation, the Bhopal disaster, and the discovery of the ozone hole. I compared the general legal trend data to these anticipated shift periods to confirm general shifts in legal activity.

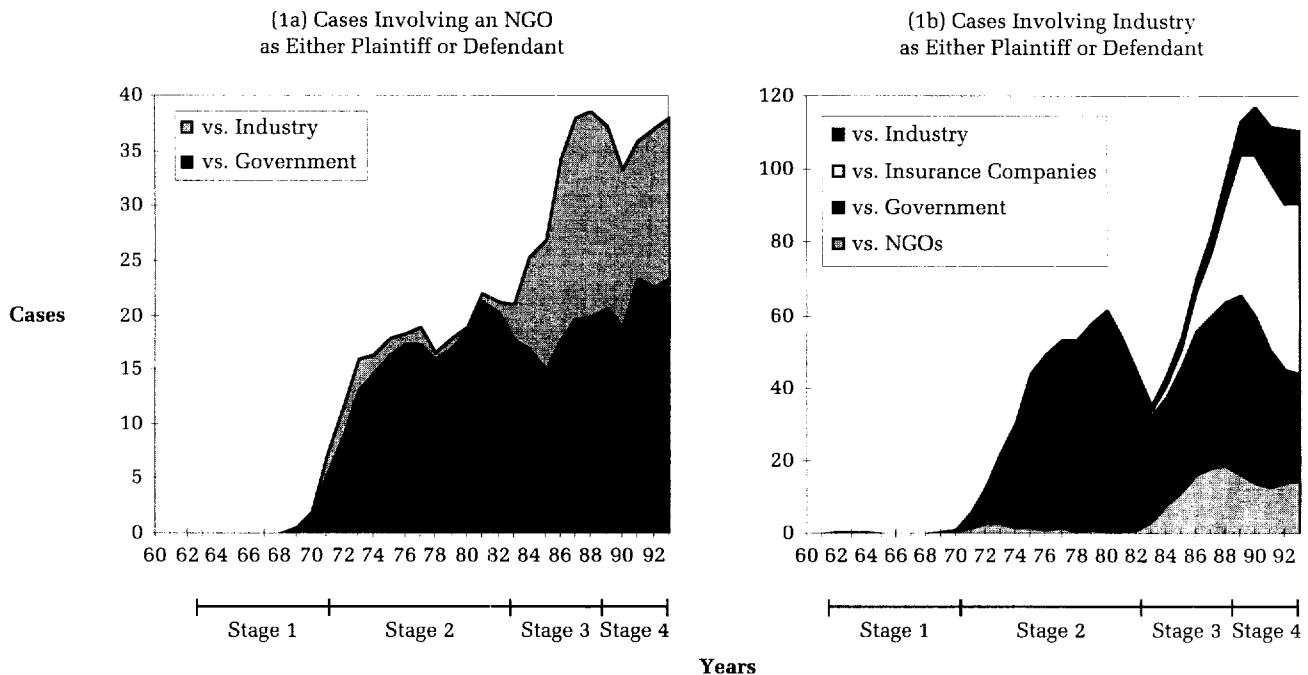
Second, I determined the specific dates of transitions by performing multiple *t*-tests on category-specific data sets based on each possible date combination² and selecting the dates for which significance was highest. I calculated a *t*-test (two-tailed with unequal variance assumed) for each type of legal activity (for instance, cases in which NGOs opposed industry organizations or in which government opposed industry), comparing the annual mean number of cases filed in a prior stage with the mean for the following stage. (Nonparametric testing through the Mann-Whitney *U*-test yielded similar results.) In the first stage, from 1962 through 1970, legal activity was negligible. During stage 2, beginning in 1971 and continuing through 1982, the primary legal engagement was between NGOs and the government ($p \leq .001$) and between industry and the government ($p \leq .001$). Stage 3 began in 1983, with the only detected change being the initiation of legal engagement between NGOs and industry ($p \leq .01$). Finally, stage 4 emerged over a three-year period with the entry of a new player and the initiation of a new type of legal activity among existing players. First, insurance companies and industry began to sue each other in 1987 ($p \leq .001$) and second, industry organizations began to sue other industry players in 1989 ($p \leq .01$). I used a mean stage shift date of 1988, which was also significant for the individual *t*-test. Figure 1 graphically summarizes these four stages.

Trade Journal Content Analysis

Institutions are reflected in the content, rhetoric, and dialogue patterns among field constituents. Rather than attempt to capture such content within

² For example, 1969 with 1980, 1981, 1982, and so on.

FIGURE 1
Environmental Cases Filed in Federal Courts, 1960–93^a



^a These data are three-year rolling averages.

the entire field identified by the legal data, in this part of the research study I focused on the institutional framing of environmentalism situated within one population, U.S. chemical manufacturers. As previously discussed, specific institutions may lie at the center of an issue-based field, but competing institutions may be located within individual populations that inhabit that field. To capture the institutions situated within the population of U.S. chemical manufacturers, I performed a content analysis (Stone, Dunphy, Smith, & Oglivie, 1969; Weber, 1985) of environmental coverage within an industry trade journal. I chose a trade journal because such a publication offers specialized coverage for specific audiences, providing information through the frames of reference of the focal industry's readership. Trade journals' role in the institutionalization process is twofold. First, they act as a historical record of key issues and events as perceived from within an industry as well as of the motivating factors behind industry actions. Second, they are themselves organizational players whose output influences issue interpretation and is subject to the political pressures exerted by powerful figures within industries (Molotch & Lester, 1975). Trade journal coverage is, by definition, a biased interpretation of events and issues, where the bias reflects the interests of a journal's core readers and its sources of information (Clinton,

1996; Molotch & Lester, 1975). As "a force within the society for socialization of the young and attitude change in the old" (Webb, Campbell, Schwartz, & Sechrest, 1966: 78), trade journals represent the situated perspectives of both the constituent readership and the business press that represents them. As such, they reflect the attention of specific populations.

To identify the situated perspective of the chemical industry population, I considered analyzing *Chemical Week*, *Chemical & Engineering News*, and *Chemical Engineering*. The two latter journals served both the chemical and the petroleum industries, and *Chemical and Engineering News* targeted academic and governmental audiences. Given this dilution in constituency, *Chemical Week* stood out as a central dedicated communication channel within the U.S. chemical industry and as likely to adequately depict the textual features of industry discourse within this particular field's population.

Between 1960 and 1993, *Chemical Week* published 1,750 weekly issues. I identified 2,358 articles in these issues as relating to the protection or preservation of natural resources, the political and social aspects of environmental protection, the technological or management concerns related to both regulatory compliance and pollution control, or business aspects of environmental regulation or

TABLE 1a
Results of Content Analysis of *Chemical Week* Articles about Environmental Issues, 1962–93, Aggregated by Stage and Action

Action Focus	Stage 1, 1962–70		Stage 2, 1971–82		Stage 3, 1983–88		Stage 4, 1989–93	
	Percentage	Mean (s.d.)	Percentage	Mean (s.d.)	Percentage	Mean (s.d.)	Percentage	Mean (s.d.)
Technology	55	16.05 (6.02)	33	24.11 (7.65)	19	14.76 (2.04)	12	16.66 (4.32)
Regulation	34	9.92 (5.12)	41	29.96 (8.82)	58	45.05 (7.78)	51	70.79 (11.67)
Enforcement	7	2.04 (2.90)	14	10.23 (4.71)	9	6.99 (0.84)	9	12.49 (4.14)
Management	4	1.16 (2.50)	12	8.77 (3.20)	14	10.87 (5.71)	28	38.86 (17.60)

pollution control.³ To begin, I used trends in aggregate article volume to represent the fundamental level of attention directed toward the environmental issue by the industry. Other legitimate measures could have included the length of articles (the number of pages dedicated to environmental issues) or the presence of cover stories, but article volume was a more feasible measure given the content analysis of which it was a part.

I found that aggregate journal attention to environmental issues mapped onto four stages similar to those found in the legal data. I confirmed the timing of these stages by performing linear regression analysis on the quarter-year time trend data with date shifts detected via the legal data analysis. Appendix A contains the regression equation and results. Specifically, attention to environmental issues within the chemical industry grew in the early 1960s ($b_1 = 0.32$, $p \leq .001$), reaching a peak around 1970, after which attention declined through the 1970s ($b_2 = -0.19$, $p \leq .001$). Between 1982 and 1988, attention grew slowly ($b_3 = 0.17$, $p \leq .05$), and from 1988 to 1993, it grew at a very rapid pace ($b_4 = 1.70$, $p \leq .001$).⁴

With stages identified, I proceeded to manually code article content within the stages. Computer-aided analyses were ruled out because the articles predated digital storage and were so voluminous that it would have required an enormous amount of computer time to scan them. In the end, a fundamental analysis of the article content was conducted, allowing for a reasonable level of accuracy

in manual analysis. My particular interests were who was identified as relevant in the journal's environmental coverage and how the environmental issue was framed. I coded the player in each article (whom the article was written about) and the action being taken by the player (what the article was written about). Action was coded in terms of specific types and then grouped under four headings: management, regulation, enforcement, and technology. The coding scheme is detailed in Appendix B. This scheme provided a measure of how the environmental issue was framed, from which I could determine the institutional pillars that were important. For example, a predominance of regulatory or enforcement articles would suggest a stronger presence of regulative aspects of institutions, as these reflect a coercive mandate for action. A predominance of technology or management articles would suggest a stronger presence of normative or cognitive aspects of institutions, as these reflect a motivation for action centered more within industry.

The content data revealed that the four stages identified by the legal and attention data represented significantly different perspectives on the environmental issue. As shown in Table 1a, each stage differed in terms of the balance among technology, regulation, enforcement, and management as foci. These differences in journal content distribution were statistically significant ($\chi^2_9 = 42.37$, $p \leq .005$). Table 1b shows journal content data more finely aggregated first by actor and second by the actions associated with each actor. These data reveal how each actor was viewed by the journal and yield further insights into the institutional evolution of the issue.

Finally, the trade journal analysis was used to identify specific disruptive events that might be considered influential in driving an evolution in chemical industry perspectives on the environmental issue. As noted above, to help me identify important disruptive events that occurred during my study period, I previewed several environ-

³ Articles regarding nuclear power and nuclear wastes were excluded for two reasons. First, the legal data did not include this issue, and I sought consistency between sources. Second, I viewed this issue as distinct from the chemical industry environmental issues and therefore as outside the focus of this study.

⁴ Interestingly, this trend in the chemical industry's attention to environmental issues is nearly identical to trends in public opinion on environmental issues reported by Dunlap (1991).

TABLE 1b
Results of Content Analysis of *Chemical Week* Articles about Environmental Issues, 1962–93, Aggregated by Stage, Player, and Action

Focal Actor and Action ^a	Stage 1, 1962–70		Stage 2, 1971–82		Stage 3, 1983–88		Stage 4, 1989–93	
	Percentage	Mean (s.d.)	Percentage	Mean (s.d.)	Percentage	Mean (s.d.)	Percentage	Mean (s.d.)
Summary of study period								
Industry	56	16.34 (9.05)	46	33.60 (11.08)	39	30.29 (7.27)	50	69.40 (19.48)
Government	42	12.25 (6.00)	48	35.08 (9.70)	54	41.94 (6.38)	45	62.46 (13.41)
NGOs	2	0.58 (2.84)	5	3.64 (1.93)	6	4.66 (1.72)	4	5.56 (1.41)
Other	—		1	0.73 (0.65)	1	0.78 (1.17)	1	1.39 (0.55)
Industry								
Technological research and development (T)	66	10.78 (5.30)	43	14.48 (5.81)	27	8.17 (2.71)	14	9.71 (3.20)
Discussion of regulatory costs (R)	7	1.14 (1.22)	17	5.71 (3.09)	4	1.21 (1.35)	8	5.55 (1.97)
Development of new regulatory programs (R)	3	0.49 (0.67)	8	2.69 (2.07)	16	4.84 (2.08)	10	6.94 (1.17)
Corporate strategies for dealing with environmental issues (M)	1	0.16 (0.40)	3	1.01 (0.86)	16	4.84 (2.08)	13	9.02 (1.17)
General management issues (M)	5	0.82 (1.49)	10	3.36 (2.43)	6	1.81 (2.15)	26	18.04 (12.82)
Market opportunities created by environmentalism	2	0.03 (0.65)	6	2.02 (1.26)	6	1.82 (1.11)	8	5.56 (1.86)
Public relations (M)	7	1.14 (1.34)	2	0.67 (0.83)	4	1.21 (1.41)	10	6.94 (4.36)
Other	9	1.47 (1.54)	11	3.69 (2.43)	21	6.36 (4.71)	11	7.63 (4.29)
Government								
Technological research and development (T)	6	0.74 (0.81)	8	2.81 (2.50)	7	2.96 (1.90)	5	3.12 (1.83)
Development of new regulatory programs (R)	47	5.75 (3.09)	61	21.39 (6.49)	70	29.36 (5.24)	67	41.85 (9.25)
Regulatory enforcement (E)	20	2.45 (2.39)	21	7.37 (3.63)	11	4.61 (2.19)	12	7.49 (3.62)
Other	27	3.30 (2.79)	10	3.51 (2.34)	12	5.04 (3.41)	16	9.99 (6.55)
NGOs								
Technological research and development (T)	—		—		38	1.77 (0.69)	56	3.12 (0.52)
Criticism of regulatory programs (R)	—		22	0.80 (0.48)	12	0.56 (0.49)	12	0.67 (0.52)
Politics and political lobbying (R)	45	0.26 (0.30)	30	1.09 (0.66)	21	0.97 (0.79)	—	
Legal action in response to regulatory action (E)	50	0.29 (0.30)	22	0.80 (0.63)	13	0.61 (0.49)	11	0.61 (0.52)
Public protests against corporate or government activity (E)	—		22	0.80 (0.48)	13	0.61 (0.49)	19	1.06 (0.84)
Other	5	0.03 (0.06)	4	0.01 (0.07)	3	0.14 (0.21)	3	0.17 (0.16)

^a Letters in parentheses indicate the subcategory to which an action belonged. T is technology, R is regulation, M is management, and E is enforcement.

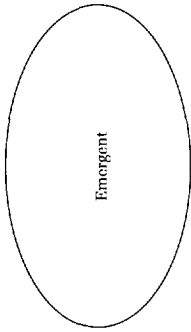
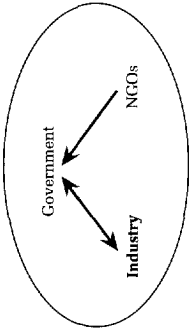
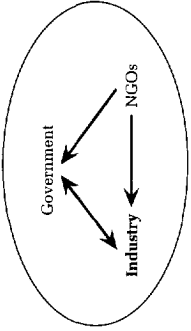
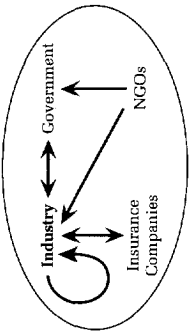
mental history references (Gottlieb, 1993; Hoffman, 1997; Scheffer, 1991) and developed a preliminary list of prominent events (see Appendix C). For example, public concern over pesticide hazards (Carson, 1962), urban smog, ocean oil spills, and river pollution (Ophiem, 1993) propelled what many refer to as the modern environmental era, which is viewed as beginning in the early 1960s (Scheffer, 1991). By familiarizing myself with this list as an initial guide, I could more easily identify critical events. Those events that received prominent attention prior to each of the

four stages identified statistically by the data analysis were noted.

RESULTS

From the assembled legal and journal data, an institutional history of chemical industry environmentalism emerged. Figure 2 diagrams this history. Conceptions of environmental management moved through four stages, each differentiated by the configuration of the organizational field driving corporate environmentalism (based on legal activity) and

FIGURE 2
The Institutional History of Chemical Industry Environmentalism^a

Stage 1, 1962-70	Stage 2, 1971-82	Stage 3, 1983-88	Stage 4, 1989-93
Disruptive Events <ul style="list-style-type: none"> • Publication of <i>Silent Spring</i>, 1962 • Fish kills on the Mississippi River, 1963 	Disruptive Events <ul style="list-style-type: none"> • Earth Day, 1970 • Formation of the EPA, 1970 	Disruptive Events <ul style="list-style-type: none"> • Tenure of Ann Burford Gorsuch as administrator of the EPA, 1981-83 	Disruptive Events <ul style="list-style-type: none"> • Bhopal, 1984 • Ozone hole discovery, 1985 • Toxics Release Inventory, 1987 • Montreal Protocol, 1987 • United Nations (UN) forms climate change panel, 1988 • <i>Exxon Valdez</i> spill, 1989 • Responsible Care Program, 1990
Organizational Field 	Organizational Field 	Organizational Field 	Organizational Field 
Chemical Industry Institutions <p>Environmentalism as a challenge to the existing institutional order. Journal focused on self-reliance and technological optimism.</p>	Chemical Industry Institutions <p>Environmentalism as a regulative institution. Journal focused on legal compliance and resistance to additional regulation.</p>	Chemical Industry Institutions <p>Environmentalism as a normative institution. Journal focused on social responsibility and cooperation with EPA.</p>	Chemical Industry Institutions <p>Environmentalism beginning to become a cognitive institution. Journal focused on managerial solutions, merging economic and environmental concerns and fieldwide cooperation.</p>

^a The arrows in the field diagrams represent the distinction between plaintiffs and defendants. Unidirectional arrows connote a predominance of lawsuits from the plaintiff to the defendant. Two-way arrows represent equal proportions of lawsuits initiated by the two players. The journal was *Chemical Week*.

the institutional pillars by which environmentalism was defined (based on journal content).⁵ The initiation of each stage corresponded to the emergence of one or more disruptive events noted as important in the trade journal analysis. Although causal connections between any of the three variables (field, institutions, and events) cannot be proven but only inferred, my purpose in this research was to provide a relatively complete description of how a field and institutions coevolved in the context of a series of prominent events.

Stage 1: 1962–70

In 1960, industry attention to environmental issues was low. Fewer than five environmental articles appeared in *Chemical Week*, and no federal environmental cases were filed. With this level of attention as a backdrop, concern about environmental issues emerged, and this study's institutional history began.

Disruptive events. The first environmental event to receive significant coverage in *Chemical Week* was the June 1962 publication of *Silent Spring* (Carson, 1962). Rachel Carson, the book's author, charged that the pesticide DDT was a persistent presence in the food chain and that continued use of this and other synthetic chemicals would disrupt the "web of life," posing a hazard to all living organisms, including humans. Although the journal dismissed the book's concerns as unrealistic and based on data and methods that lacked credibility, several mass deaths of fish (fish kills) on the Mississippi River in 1964, one involving the death of over a million fish, intensified industry attention to the environmental issue.

Organizational field. Given that a mean of only 0.54 environmental cases per year were filed in federal courts between 1962 and 1970, the organizational field might be described as nonexistent. However, I interpreted this low level of activity as reflecting a weakness in the data source. Since coverage within *Chemical Week* grew rapidly throughout this time period, the environmental movement may be more accurately described as emergent,

though not yet looking to the courts as a means by which to pursue change.

Chemical industry institutions. From 1962 through 1970, the volume of *Chemical Week*'s environmental articles grew by over five times. The dominant theme was that the environmental issue was a problem that could be solved independently through the industry's own technological prowess. Fifty-five percent of *Chemical Week*'s environmental articles (see Table 1a) and 66 percent of its industry-specific articles (see Table 1b) dealt with technology. Indicative of this optimism, one *Chemical Week* editorial boldly promised a "non-polluting auto by 1975, economically competitive extraction of oil from shale by 1980; and an inexpensive method for removing sulfur from coal before burning by 1983" (May 13, 1970: 5).

Overall, *Chemical Week* articles denied the severity of environmental problems and touted the industry's ability to solve them because doing otherwise would contradict the beliefs upon which its identity was based. The accepted belief was that engineering advances improved the quality of life for all humankind (Florman, 1976). But environmentalism challenged that notion, initiating a clash between the taken-for-granted beliefs within the industry and society's emerging questions regarding their validity. *Silent Spring* became a touchstone for that clash, precipitating increased dialogue among certain types of chemical firms and marking the early formation of an organizational field centered on the issue of environmentalism (DiMaggio, 1983).

Stage 2: 1971–82

In this study, the timing of revolutionary shifts was not generally precise (see footnote 5). However, the shift between the first and second stages occurred suddenly and coincided with two critical events that focused industry attention on the environmental issue.

Disruptive events. The first was the April 22, 1970, celebration of the first Earth Day, a national teach-in involving 20 million Americans on college campuses across the country. Industry was vilified during the event, with students at one rally in New York calling the representatives of 12 leading companies (including 2 of the nation's 10 largest chemical companies) the "handmaidens of Satan" (*Chemical Week*, March 4, 1970: 64). This event captured the growing public concern for environmental issues and was followed by an emergence of environmental attention within the realm of government. On December 4, President Nixon initiated the second and more important event of the year—

⁵ It is important to note that these stages should not be viewed as strictly homogeneous but rather as depicting dominant trends between shifting points. Likewise, the dates are intended not to be precise but to depict revolutionary periods that vary from the first, rather definitive shift in 1970 to more diffuse shifts between 1981 and 1983 and between 1987 and 1989. However, to delineate the stages, I used the mean date of each shift as the shifting point; these mean dates were 1970, 1982, and 1988.

the creation of the U.S. Environmental Protection Agency.

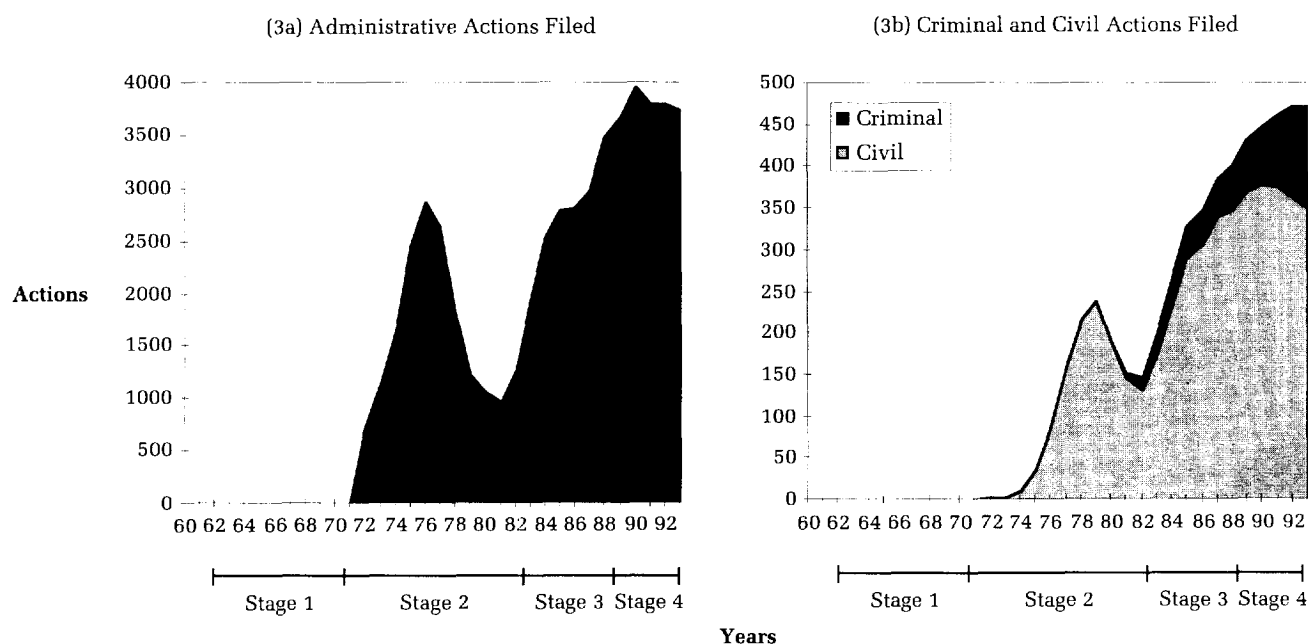
Organizational field. The establishment of the EPA precipitated a formal structure for the organizational field that went beyond the increasing dialogue that marked the field's formative stage in the 1960s. Legal data show nongovernmental organizations (NGOs) and industry fighting a battle over legitimate environmental practice, with the EPA at the center. NGOs filed a mean 16.49 lawsuits per year from 1971 until 1982, with 91 percent of these directed at the EPA. (NGOs were rarely defendants in lawsuits.) Industry filed a mean 28.92 lawsuits per year, with 98 percent directed at the EPA. For its part, the EPA increased its administrative actions against industry; as Figure 3 shows, the number of these actions reached more than 2,500 per year by 1976. Between NGOs and industry, there was very little interaction. The EPA had become the medium through which this interaction took place; the agency might be described as either an adjudicator between NGO and industry conceptions of legitimate corporate behavior or as a means by which NGO expectations were filtered for industry. In either case, the organizational field is depicted as comprising three actors, with interaction patterns that reflect the reciprocal interplay between industry and government and the unilateral

interplay between NGOs and government as depicted by the arrows in Figure 2.

Chemical industry institutions. With the formation of the EPA, a *regulative* institutional pillar was established regarding chemical industry responsibility for the environment. From 1971 through 1982, the issue was framed less in terms of environmental protection and more in terms of compliance with government standards. Over the period, regulation and enforcement articles displaced those on technology, garnering 55 percent of overall environmental coverage (see Table 1a). At the same time, industry-specific articles declined by 10 percent, to be replaced by articles focused on government and, to a lesser extent, NGOs (see Table 1b). Neither was viewed in a constructive light, with 82 percent of government-specific articles focused on regulatory development or enforcement and 44 percent of NGO-specific articles focused on legal activities or protests (see Table 1b).

This regulative framing of environmental issues initially met little opposition. Indicative of an optimistic outlook, one *Chemical Week* article anticipated a common set of environmental standards to "help bring order out of the confusion" and a "pollution policy that is both sane and enforceable" (*Chemical Week*, November 18, 1970: 5). *Chemical Week* articles displayed a con-

FIGURE 3
U.S. EPA Enforcement Activity, 1960-93^a



^a These data are three-year rolling averages.
Source: U.S. Environmental Protection Agency (1994).

fidence that the industry could resolve environmental problems as they were then perceived through technological development. The EPA would simply identify what needed to be done. I interpret this confidence as explaining why attention to the issue dropped off through the decade (see Appendix A).

But as a growing environmental regulatory infrastructure was developing by the late 1970s, the tone of *Chemical Week's* rhetoric became increasingly heated, displaying first resistance and then confrontation as the journal saw the EPA becoming, in its view, too powerful and intrusive. Each sequential addition of regulation increased the burden on industry to implement greater levels of environmental controls at steadily increasing costs. Indicative of this concern, one editorial stated, "Congress seems determined to add one more regulation [the Toxic Substances Control Act] to the already 27 health and safety regulations we must answer to. This will make EPA a chemical czar. No agency in a democracy should have that authority" (*Chemical Week*, October 29, 1975: 5). In another editorial, this statement appeared: "Have the Davids we used to cheer assumed some of the trappings of a Goliath? In little more than a decade, the U.S. Chemical Industry has been smothered with upwards of 30 health and safety enactments. It is an industry virtually run, not just regulated, from State and Federal Agencies. Have the Davids upset the political 'ecology' to such an extent that the field is left to the biggest predator of them all, big government?" (*Chemical Week*, January 2, 1980: 5). By 1980, the regulative aspects of environmental legislation were at significant odds with the cognitive beliefs held by industry members regarding what was reasonable, breeding institutional tension within the organizational field.

Stage 3: 1983–88

Although a decline in EPA administrative enforcement began in 1976, and a subsequent decline in civil enforcement began in 1979, the chemical industry perception that the EPA had exceeded its bounds was fixed. This mindset would drive the next institutional shift in 1983.

Disruptive events. In 1983, one environmental event received more editorial attention in *Chemical Week* than any other environmental event in the 34 years of this study—the firing of EPA administrator Ann Burford Gorsuch. Gorsuch was appointed to the post by President Reagan as part of his agenda of "defederalization" and regulatory reform. Re-

sponding to growing industry frustration with the burdens of environmental regulation, Gorsuch attempted to dismantle, or deinstitutionalize (Jepperson, 1991), the EPA's growing environmental regulatory infrastructure. She announced that the EPA wanted cooperation rather than confrontation with industry and extended overtures for a partnership with the regulated community. However, closed meetings created an air of favoritism, and secret deals and Gorsuch's restrictions on EPA budget and staff created a widespread public and political backlash that resulted in her removal in 1983.

Organizational field. The end result of this debacle was a transformed field structure. No constituents were added, but the interaction patterns among existing constituents were shifted. NGOs increased their legal activity by over 100 percent, compared to 1970–82 activity, and instead of directing all of that attention at the government, they now directed a third of their lawsuits at industry. I interpret this shift as suggesting that NGOs now saw the EPA as prone to cooptation and at risk of becoming simply a government-funded buffer for industry. For its part, the EPA attempted to regain its institutional credibility by increasing civil and administrative actions and introducing criminal actions against industry (see Figure 3). In the end, the field was not expanded but rather, restructured, as shown in Figure 2.

Chemical industry institutions. With the removal of Gorsuch, a new conception of environmentalism emerged within *Chemical Week*, a conception that suggests that environmentalism was becoming established at the level of a normative institution. First, journal attention began to refocus attention on industry activity. To confirm a structural break in trends in the player focus shown in Table 1b, I performed a Chow test (Chow, 1960) for structural stability for pre- and post-1982 industry-specific environmental coverage. The results indicated that the regression equations for the two periods were significantly different ($p \leq .001$). The previously declining industry coverage now began to increase.

Journal attention also began to reflect a more cooperative posture toward both the EPA and NGOs. Industry complaints about regulatory costs decreased from 17 to 4 percent of coverage and, despite the increasing enforcement shown in Figure 3, articles about government enforcement declined from 21 to 11 percent (see Table 1b). Contrary to past rhetoric, and indicative of an industry effort to regain the EPA as an ally, many editorials were now supportive of the embattled agency: "EPA has been criticized for going too slow on RCRA [the Resource Conservation and Recovery Act]. Still, we think that it is doing a good job"

(*Chemical Week*, June 9, 1982: 3). Another editorial stated "Critics expect overnight fix. EPA deserves credit for its pace and accomplishments" (*Chemical Week*, November 3, 1982: 3). Similarly, in its articles about NGOs, the journal shifted from a predominate focus on legal actions and protests, showing a 38 percent increase in articles about the research NGOs performed. For example, "Nice guys may be back in style . . . the 60s and 70s saw too much confrontation with NRDC [the Natural Resources Defense Council] and EDF [the Environmental Defense Fund] versus the Pacific Legal Foundation and National Legal Center for the Public Interest. But new alliances like Clean Sites Inc. and the National Coal Policy Project may begin an 80s era of cooperation" (*Chemical Week*, September 12, 1984: 3).

Throughout this period, enforcement and regulation still gained a significant share of environmental coverage (see Table 1a), but the increasingly proactive tone of the industry journal represented environmentalism moving beyond purely regulatory concerns. Although still active at the regulatory level, corporate environmentalism was now becoming active as a *normative* institutional pillar as well. It became ethically appropriate, a matter of social obligation, to initiate controls that went beyond regulatory requirements. Representing a more self-directed set of motivations, industry-specific articles about environmental strategies increased from 3 to 16 percent (Table 1b). The dominant values and expectations of the period drove the industry to conform to the emerging notions of pollution prevention and waste minimization. As an April 1987 editorial argued, "Environmental law [is] more than compliance. Companies obeying the letter of the law are heading for trouble" (*Chemical Week*, April 8, 1987: 3).

Stage 4: 1989-93

Until stage 4, the field had evolved among the three primary participants: industry, government, and NGOs. The field would change again in 1988 to include new types of constituent interactions that would be reflected in a new conception of environmental management. This shift coincided with a series of events that initiated a shift more drawn out than the shifts to the previous two stages.

Disruptive events. From 1984 through 1990, a myriad of environmental events heightened the concern for environmental issues expressed in the pages of *Chemical Week*. The first was the 1984 methyl isocyanate release at Union Carbide's Bhopal India plant that killed over 3,000 people and injured another 300,000. *Chemical Week's* first ar-

ticle on the event expressed the view that this accident was an industry-wide issue, asking in its headline, "How Will Carbide's Misfortune Shape Chemicals' Future?" (*Chemical Week*, December 12, 1984: 8). Subsequent coverage was presented in a newly created Bhopal section that appeared weekly. Other events receiving prominent *Chemical Week* coverage included the emergence of concern over the hole in the ozone layer in 1985; the enactment of the Toxics Release Inventory (under Title III of the Superfund Amendments and Reauthorization Act of 1986), which required companies to publicly report all forms of pollution created at their plants beginning in 1987; a UN treaty halting the production of ozone-depleting chemicals in 1987 (the Montreal Protocol); the emergence of concern over global warming in 1988; and the *Exxon Valdez* oil spill in Prince William Sound on March 24, 1989. Finally, one event that drove tremendous change at *Chemical Week* was the initiation of the Responsible Care Program of the Chemical Manufacturers Association in 1990, a program that outlined a set of proactive environmental principles that all members of the trade association would be required to adopt.

Organizational field. With the occurrence of these events, the makeup of the organizational field shifted in a dramatic fashion to include a new player and a new interaction pattern in 1988 (see Figure 2). First, lawsuits between insurance companies and industry emerged. A mean annual 16.75 lawsuits were filed with insurance companies as plaintiffs, and a mean annual 30.65 lawsuits were filed with insurance companies as defendants. Most of these lawsuits were in response to cutbacks in pollution coverage made by the insurance industry in the wake of the Bhopal disaster. Second, industry-versus-industry suits grew in prominence. Although low levels of such activity had been noted since 1984, the numbers grew dramatically from only 2 in 1987, to 8 in 1988, with an annual mean of 14.3 through 1993. These cases were generally disagreements over liability for waste site cleanup under the aegis of the Superfund program.

Chemical industry institutions. The introduction of the economics-based constituents described in the previous subsection coincided with a reconception of environmental management in the pages of *Chemical Week*. By the end of 1993, attention to environmental issues had reached unprecedented levels. Coverage of management had grown to 28 percent of overall environmental coverage (see Table 1a) and 57 percent of industry-specific coverage (see Table 1b). One major reason for this shift in posture was the Responsible Care Program. Two entire issues were devoted to the program in each

of the years 1991, 1992, and 1993. Representing an important component of "responsible care"—improving the image of the industry—the journal now devoted 10 percent of industry coverage to public relations.

The journal's content reflected a belief that industry was now a part of the solution to environmental problems. Demonstrating a strikingly proactive posture, the journal actively pursued debate on such emerging and controversial issues as environmental racism and chlorine phaseout. The journal's environmental coverage was now about management, strategy, and public relations as much as regulation and technology (see Tables 1a and 1b). And in seeking solutions to environmental problems, NGOs were being seen as partners. Of the NGO-specific coverage, 56 percent focused on their research (see Table 1b) and their growing participation in business partnerships.

Although the regulative and normative pillars were still active in this stage (as evidenced in Table 1a), environmentalism might be described as beginning to include a *cognitive* institutional pillar. Unfortunately, the presence of cognitive institutions is extremely difficult to measure. But environmental and core economic conceptions of corporate activity appeared to be merging at *Chemical Week*. For example, what were previously environmental issues—recycling and water treatment—were now being covered as mainstream chemical industry market niches. Illustrating a new mindset, a November 1990 editorial proclaimed "Green line equals bottom line—The Clean Air Act equals efficiency. Everything you hear about the 'costs' of complying with CAA is probably wrong. . . . Wiser competitors will rush to exploit the Green Revolution" (*Chemical Week*, November 21, 1990: 5).

Some evidence suggests that this period saw a culturally supported belief in the idea of baseline corporate environmental responsibilities. That companies would no longer dump hazardous wastes in an unsecured landfill could safely be considered a taken-for-granted belief. If a company chose to undertake such an activity, it would do so with the full knowledge that it was deviating severely from existing legal and ethical institutions. Similarly, the widespread adoption of organizational and strategic innovations, such as environmental annual reports, pollution prevention programs, and environmental vice presidents, and the growing rhetoric around win-win scenarios for gaining strategic advantage through environmental management (e.g., Porter & van der Linde, 1995; Schmidheiny, 1992) suggest some degree of taken-

for-granted beliefs about legitimate corporate environmental practices.

IMPLICATIONS

This research was built from an empirical analysis of evolving conceptions of corporate environmentalism from 1960 through 1993. As the results indicate, the study period was witness to concurrent evolution in the field of relevant actors and the institutions by which the chemical industry defined the environmental issue. Further, these results offer contributions to the study of institutional theory and the relationship between organizations and the natural environment. For the remainder of this article, I will explain some limits to both areas as they presently exist, discuss what contributions this research offers for overcoming these limits, and present some possible next steps for future research.

Institutional Theory

One problem that plagues institutional theory is broad disagreement over the theoretical definition and empirical measurement of core concepts such as organizational fields and institutions (Dacin, 1997). Another is its failure to adequately address the issue of change (Hirsch & Lounsbury, 1997). This article's analysis contributes to resolving each issue.

Organizational fields. The representation of the organizational field in this article identifies field membership as based on a central issue, not on a common technology or market. An issue-based field is consistent with the notion that the organizational field is the center of common channels of dialogue through which normative and cognitive influence is exerted on organizations (Scott, 1991). With such a frame, the presence of a field structure should be analytically detected through an increase in the extent to which certain organizations interact and engage in a common debate (DiMaggio, 1983).

In this study, I empirically grounded the construct of the field through an analysis of the pattern of organizational interactions in the federal court system that pertained to the issue of environmental protection. Field membership was defined by who participated in the legal process and therefore had a voice in determining institutional norms regarding environmentalism. Thus, this article describes an organizational field whose membership and bounds were not externally imposed by the experimenter but emerged from the data. Furthermore, I developed a longitudinal measurement of the field that exposed its evolving membership and interac-

tion patterns. The field was empirically represented as a dynamic source of influence that had meaning to the organizations within it, because legal cases have a direct impact on corporate perceptions and action.

One major limitation of this measure was, as already mentioned, that it restricted its view to field-level constituents who utilized legal channels for interacting with other organizations. The measure thus overlooked many constituents who should be part of a model that captures all of the influence of institutional phenomena and change. For example, the measure failed to capture the presence of any field members between 1960 and 1970, although some form of institutional influence could be detected through the content analysis of *Chemical Week*. Who were the institutional entrepreneurs driving the emergence of the environmental movement during this period, and how did they do it? In order to draw in these additional sources of influence, analysis must be located within each actor's particular communication and interaction channels. Investor influence, for example, can be identified through filings of environmental proxy resolutions, the number of which jumped from only 3 in 1989 to 43 in 1990 and had a mean of 59.6 from 1990 through 1993 (Interfaith Center on Corporate Responsibility, 1988–94). The press influences legislative action and corporate policy through the volume and content of news coverage (Proteus et al., 1987). Field constituency must be detected through an analysis of interaction channels that are relevant to each player.

Institutions. This article suggests that, to capture the full scope of institutional dynamics, researchers must analyze both the specific institutions that lie at the center of an issue-based field and the competing institutions that may lie within the individual populations (or constituencies) that inhabit that field. Supporting this notion, in this research I captured the situated institutions of the chemical industry through the journal dialogue among U.S. chemical manufacturers. I found these institutions to have evolved in content and form. This finding supports the view that the regulative, normative, and cognitive institutional pillars are connected, with transitions among the three possible (Hirsch, 1997), and that the pillars are not analytically and operationally distinct (Scott, 1995). Each of the four historical stages was presented as a period in which one institutional pillar was dominant, and evolution from one type to the next was noted. The sequence was as follows: (1) a questioning of prior institutional beliefs, (2) a regulative institution, (3) a normative institution, and (4) a cognitive institution. During each stage, pillars

other than the dominant one were still noted as active and were sometimes at odds with and sometimes consistent with the dominant pillar.

This allowance for interconnection does not grant each type of institution equal standing in the broader organizational field (Hirsch, 1997). For example, regulative and normative aspects of institutions are "the products of human design, [and] the outcomes of purposive action by instrumentally oriented individuals" (DiMaggio & Powell, 1991: 8); thus, opportunity for deviance and contestation can be expected (Hirsch, 1997). But the cognitive aspects of institutions are the most entrenched. They form taken-for-granted beliefs and are resistant to change (DiMaggio & Powell, 1991; Hirsch, 1997). In the history of chemical industry environmentalism, the belief that technological progress improved the quality of life but required the acceptance of a certain level of risk persisted as a cognitive institution, despite the gradual incorporation of associated environmental institutions. For example, in response to *Silent Spring*, an editorial argued that "in pest control—as in medicine, law, or international diplomacy—we must weigh risks against benefits. . . . Is the survival of civilization worth a few pounds of fallout?" (*Chemical Week*, July 28, 1962: 5). In response to Love Canal, the journal explained that "Every so often something goes wrong" (*Chemical Week*, August 16, 1978: 5). And in response to Bhopal, an editorial stated "One accident, bad as this one is, does not negate all the good that modern technology has safely brought to us for many years . . . how many Indians live healthier, longer lives because of the products made at Bhopal?" (*Chemical Week*, December 19, 1984: 3). Industry response to each of these events revealed how environmental concerns remained a challenge to entrenched cognitive institutions regarding the benefits of technology despite their environmental risks. Only through time would it be reasonable to expect that cognitive institutions would change as particular rules or norms became less contested through enduring persistence. Eventually, they would become accepted as the legitimate form of organizational action and ingrained in the cognitive institutional realm.

Organizations and the Natural Environment

This article offers contributions and insights for research into the relationship between organizations and the natural environment. This body of literature has mainly focused on the strategic actions of individual organizations (e.g., Lawrence & Morell, 1995; Lober, 1996; Shrivastava, 1995). For example, Hart advanced a "theory of competitive

advantage based upon the firm's relationship to the natural environment" (1995: 986), and Porter and van der Linde argued that "companies must start to recognize the environment as a competitive opportunity" (1995: 114). But this article highlights the benefits of applying existent theories of organizational behavior to gain understanding of this phenomenon.

By applying institutional theory to explaining the evolving conceptions of environmental management, I have examined the cultural and institutional systems of which organizations are a part. This article goes beyond assessments of individual action to ask questions about the fundamental sources of those actions. This article's institutional history shows that individual strategic action is only possible within the range of available options defined by the organizational field (Scott, 1991). As the field evolves, so does that range of options. Thus, recent analyses of win-win scenarios that describe mutual gains for economic and environmental interests (Hart, 1997; Porter & van der Linde, 1995; Schmidheiny, 1992) only make sense in the post-1988 stage of institutional history. Further analytical study and public policy recommendations can benefit from an adjusted level of analysis that addresses social and cultural sources of habitual action and social change.

Future Directions

One issue that was raised in this article but not fully developed was the role of events in driving institutional change. Although this research could not prove a causal connection between the events detected and the institutional change that followed, such casual connections can be supported in specific cases. For example, the creation of the EPA in 1970 had a directly identifiable impact on the constituency of the field and the conceptions of environmental management that emerged. In particular, it established a legal framework that could be used to challenge industry in the courts. In another example, the increased legal activity of insurance companies in 1988 can be tied to the litigation surrounding the 1984 Bhopal disaster. A government report stated the following: "The number of insurers writing pollution insurance, the number of policies written, and the total pollution liability coverage decreased dramatically from a 1984 peak. Simultaneously, the average premium increased as much as 11 times its 1982 level" (U.S. General Accounting Office, 1988: 3). As a result of industry's increased reliance on insurers, lawsuits were filed to contest the norms regarding the definition

of environmental incidents and corresponding liability.

But a question remains as to how events drive institutional change. What distinguishes events that cause change from others that do not? Is there some way that events can be classified as to the characteristics that enable them to alter the institutional order? Do single events cause change, or are only event chains responsible for social change? The answers to these questions appear to lie in the process by which events are socially constructed within a field. In the literature on punctuated evolution, events are not singularly credited with driving periods of revolutionary change. They only create the need for it to occur (Gersick, 1991). Thus, it is important to consider how events are socially constructed through a contest over meaning among the players within an organizational field (Hannigan, 1995). Similar events occurring at different points in history can be constructed in different ways, so that their resultant impacts vary. For example, the Bhopal disaster of 1984 and the Seveso disaster of 1976 have many similarities. Although the death tolls of the disasters varied significantly, each involved the release of a toxic cloud of chemical gas over a populated neighborhood. At the time of the Bhopal disaster, the topical policy focus was corporate disclosure of chemical contaminant information to employees and local communities. Therefore, the result of this incident was the development of several community right-to-know laws, including the Toxics Release Inventory. At the time of the Seveso disaster, the banning of carcinogenic substances such as DDT was the topical focus of environmental regulation in this country. As a result, Seveso served as a catalyst for the banning of dioxin. Clearly, an oil spill in 1979 would have been constructed very differently and would have had very different institutional implications from a technically comparable oil spill in 1989.

The role of social construction leads to the question of how agency (Child, 1972) fits into the alteration of institutional systems (DiMaggio, 1988). Whereas past analyses of institutional change have located the source of institutional change in the actions of powerful constituents of the relevant field (Brint & Karabel, 1991; DiMaggio, 1991; Fligstein, 1990; North, 1990), this history depicts a less unilateral model. Change can emerge suddenly and unpredictably, thrusting institutional players into periods of revolution. At these moments, institutional entrepreneurs can be both strategic and opportunistic, taking advantage of the uncertainty in the institutional order they seek to change. These entrepreneurs cannot construct the institutional order, but they can influence its ultimate design

through participation in the institutional negotiation process that occurs during periods of revolution.

For example, Rachel Carson and Ann Burford Gorsuch figured prominently in the history of chemical industry environmentalism, but neither could control the institutional outcomes of their actions. They were both empowered and limited by the institutional environments in which they emerged. Carson was not the first to write about the dangers of DDT; its potentially damaging effects had been well documented since World War II. The impact of her writing was made possible by the political dynamics of the institutional order. The *New Yorker* serialized the book, the Book-of-the-Month Club distributed it, environmental groups and academics supported it, and President Kennedy gave it personal attention. The chemical industry could not opt out of the field-level negotiation that followed. Similarly, the actions of Gorsuch proved a critical trigger in the 1982 shift from the second to the third stage of the chemical industry's environmental evolution. Yet the outcomes of her actions were the opposite of what she had intended, because of the political backlash that followed. That backlash catalyzed the initiation of an institutional shift, whereby corporations adopted new forms of environmental responsibilities that, just two years before, they had resisted. In effect, she "reinvented the environmental movement by [her] contempt for it" (Keating & Russell, 1992: 33). As these examples show, politics, agency, and interests become central aspects of an organizational field (Selznick, 1949).

Further study must also cast a broader net in capturing events of critical importance and understanding the dynamics by which they cause change. By restricting this study's examination to *Chemical Week* coverage, I uncovered only events of importance to the chemical industry. This analysis overlooked events that may have influenced the overall field. For example, the Santa Barbara oil spill in January 1969 sparked media coverage and public outcry of a national scope, which prompted the Nixon administration to impose restrictions that still exist today on drilling in environmentally sensitive areas such as the Alaska National Wildlife Refuge (Molotch, 1970). And the Cuyahoga River fire in June 1969 is credited with capturing national attention and highlighting the need for federal standards on water pollution control (Ophiem, 1993). But although oil spills and river fires do not relate directly to chemical industry operations and were therefore overlooked, their influence on the institutional system of interest here cannot be ignored.

CONCLUSION

A current theme within institutional theory is the call for a merging of old and new institutional concepts into one coherent theory (Greenwood & Hinings, 1996; Hirsch & Lounsbury, 1997; Holm, 1995; Kraatz & Zajac, 1996). This article furthers that objective by presenting a view of organizational fields as "arenas of power relations" (Brint & Karabel, 1991: 355) wherein field-level constituents engage in institutional war (White, 1992). The outcome of this war is the product of a political negotiation process in which politics, agency relationships, and vested interests (Selznick, 1949) guide the formation of institutions that will guide organizational behavior. Ideas drawn from the old institutional theory about change, agency, politics, and interests can fit with neoinstitutional ideas about inertia and resistance to change. This adjustment breaks neoinstitutional theory free from the strict notion that social conformity will yield only predictable and isomorphic structures. Although this insight is theoretically important for keeping institutional theory vital, its implications for environmental protection are also critical. Environmental problems must be solved through changes in the institutional arrangements that govern industry and social action. As the environmental issue continues to evolve, institutional change holds promise for the development of new institutional forms that have yet to be imagined (Gersick, 1991).

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APPENDIX A

Regression Analysis for Trends in the Volume of *Chemical Week* Articles on Environmental Issues, 1960-93

Models

Number of articles = $a_0 + a_1D_1 + a_2D_2 + a_3D_3 - b_1D_1t + b_2D_2t + b_3D_3t + b_4D_4t + \text{error}$,
where

$D_1 = 1$ when 1962 (quarter 1) $\leq t \leq$ 1970 (quarter 4)
and $D_1 = 0$ all other times,

$D_2 = 1$ when 1971 (quarter 1) $\leq t \leq$ 1982 (quarter 4)
and $D_2 = 0$ all other times,

$D_3 = 1$ when 1983 (quarter 3) $\leq t \leq$ 1988 (quarter 4)
and $D_3 = 0$ all other times,

$D_4 = 1$ when 1989 (quarter 1) $\leq t \leq$ 1993 (quarter 4)
and $D_4 = 0$ all other times.

Results of Regression Analysis^a

Model	b (s.e.)
1	0.32 (0.03)***
2	-0.19 (0.03)***
3	0.17 (0.08)*
4	1.70 (0.10)***
Adjusted R^2	0.91
F	206.67***

^a $N = 136$.

* $p < .05$

** $p < .01$

*** $p < .001$

APPENDIX B

Coding Scheme for *Chemical Week* Content Analysis, 1960-93

To identify who was relevant in *Chemical Week's* environmental coverage and how the environmental issue was framed in that coverage, I coded the player in each article and the action taken. Specifically, I manually examined each weekly issue of the journal, working over a two-month period in 1993. I first reviewed the titles of the articles in the tables of contents, identifying those about environmental issues and then looking for key topics and words (see below) that would identify the actor and action in the article. If the title of an article identified a specific actor and/or action, it was coded as such. If the title was not sufficiently clear, I conducted a second-level search, reviewing the article itself for key topics and words that would allow coding. Of the entire sample of 2,358 articles, roughly 75 percent were coded through the title alone, and the remaining articles required a second-level search.

To identify and code the articles, I began with a pre-tested list of key topics and words for possible actors and actions and added to that list if new categories emerged.

Each article was coded for only one actor and one action. If two actors were identified, a dominant subject was determined. For example, if an article covered an EPA enforcement action against a particular company, the article's actor was coded as the EPA and the action was regulatory enforcement. By the end of the study, I had identified 10 categories of actors and 16 categories of actions, which were then grouped under four headings. The scheme was as follows:

Actors

The categories were (1) academics, (2) community groups, (3) customers, (4) employees, (5) financial institutions, (6) government agencies (state and federal), (7) industry groups (companies and trade associations), (8) insurance companies, (9) investors, and (10) nongovernmental organizations (NGOs). Roughly 7 percent of the articles were coded as general news items for which no actor could be identified. These were excluded from further analysis in this study.

Actions

The *technology* subcategory referred to (1) technological research and development and (2) predictions of technological development. The *regulation* subcategory referred to (3) discussion of regulatory costs, (4) criticism of regulatory programs (either existing or proposed), (5) development of new regulatory programs, and (6) politics and political lobbying. The *enforcement* subcategory referred to (7) regulatory enforcement, (8) regulatory fines, (9) legal action in response to regulatory action, and (10) public protests against corporate or government activity. The *management* subcategory referred to (11) corporate management of environmental affairs (such as staffing decisions, promotions, and organization), (12) environmental advertising and marketing, (13) public relations, (14) corporate strategies for dealing with environmental issues, (15) market opportunities created by environmentalism, and (16) general management issues.

The task of coding required some degree of specialized knowledge as well as a working vocabulary on environmental issues. For example, some environmental issues current in the 1960s are slightly esoteric by today's standards (such as thermal, noise, and aesthetic pollution). Further, the material contained many acronyms and abbreviations, such as BOD (biological oxygen demand), NOD (notice of deficiency), EIS (environmental impact statement), LCA (life cycle assessment), EDF (Environmental Defense Fund), and RCRA (Resource Conservation and Recovery Act), and special terms (such as remediation, Superfund, and pollution prevention). My ability to identify and categorize such references was greatly enhanced by previous work experience in the areas of federal environmental enforcement, environmental consulting, and corporate environmental compliance.

APPENDIX C

Preliminary Environmental Event Sample^a

1960s

- Publication of *Silent Spring*, 1962
- Agent Orange protests, against Dow Chemical, mid-1960s
- New York City garbage strikes, 1967
- Torrey Canyon*, oil spill, England, 1967
- Formation of the EDF, 1967
- DDT banned, 1968
- Oil spill, Santa Barbara, California, 1969
- Cuyahoga River fire, 1969
- Group Against Smog and Pollution (GASP) pushes for Clean Air Act (CAA), 1969
- Passage of the National Environmental Policy Act, 1969

1970s

1970s

- First Earth Day, 1970
- Formation of the NRDC, 1970
- President Nixon's "environmental" state-of-the-union address, 1970
- Formation of the Council on Environmental Quality, 1970
- Formation of the EPA, December 1970
- Passage of the Clean Air Act, 1970
- Publication of *The Limits to Growth*, 1972
- Passage of the Clean Water Act, 1972
- UN Conference on the Human Environment, Stockholm, 1972
- OPEC oil embargo, 1973
- Argo Merchant*, oil spill, Massachusetts, 1976
- Seveso. Italy, chemical release, 1976
- PCBs banned, 1976
- Key environmental leaders take positions in Carter administration
- Passage of the Resource Conservation and Recovery Act (RCRA), 1976
- Passage of the Toxic Substances and Control Act, 1976
- Love Canal, waste dump, New York, 1978
- Amoco Cadiz*, oil spill, France, 1978
- Formation of Greenpeace U.S.A., 1979
- Three Mile Island nuclear plant failure, 1979
- Burmah Agate*, oil spill, Texas, 1979
- Passage of Superfund, 1980
- Georgia*, oil spill, Louisiana, 1980
- Olympic Glorv*, oil spill, Texas, 1981

1980s

Ann Gorsuch Burford heads EPA, 1981–83
James Watt heads the Department of the Interior, 1981–83
Arkas Montz, oil spill, Louisiana, 1982
Times Beach, Missouri, waste dump, 1982
Passage of the RCRA Amendments, 1984
Alvenus, oil spill, Louisiana, 1984
Bhopal, India, chemical release, 1984
Puerto Rican, oil spill, California, 1984
Detection of the ozone hole, 1985
Group of Ten publishes *An Environmental Agenda for the Future*, 1985
Switzerland, Sandoz chemical release, 1986
Passage of the Superfund Amendments and Reauthorization Act (SARA), 1986
First Toxics Release Inventory reports due, 1987
Mobro 4000 garbage barge, 1987
Montreal Protocol, 1987
Publication of *Our Common Future* by the UN and introduction of the term *sustainable development*, 1987
Esso Puerto Rico, oil spill, Louisiana, 1988
UMTB 283, oil spill, Alaska, 1988
UN Toronto Conference to control global warming, 1988
Alar controversy, 1989
Declaration of the Coalition of Environmentally Responsible Economies (CERES) Principles, 1989
Exxon Valdez, oil spill, Alaska, 1989

1990s

- Mega Borg, oil spill, Texas, 1990
- Jupiter, oil spill, Michigan, 1990
- Passage of the Clean Air Act Amendments, 1990
- Formation of the Chemical Manufacturers' Association (CMA) Responsible Care Program, 1990
- Formation of the American Petroleum Institute's Strategy for Today's Environmental Partnership (API STEP) program, 1990
- Earth Day, 1990
- Formation of the Business Charter for Sustainable Development, 1991
- Initiation of the EPA's 33/50 Program, 1991
- UN Conference on the Global Environment, Rio, 1992
- Declaration of the Public Environmental Reporting Initiative (PERI), 1993

^a Acronyms and abbreviations are used exclusively or are included in parentheses where they may be more familiar than the longer names they represent.

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