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ENVIRONMENTAL CONTROVERSIES, NEWS MEDIA, AND THE STATE: THE CASE OF SYNTHETIC ORGANIC PESTICIDES IN THE 1940s, 1950s, AND 1960s

BY

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ABSTRACT

ENVIRONMENTAL CONTROVERSIES, NEWS MEDIA, AND THE STATE: THE CASE OF SYNTHETIC ORGANIC PESTICIDES IN THE 1940s, 1950s, AND 1960s

By

Valerie J. Gunter

This dissertation reports on an in-depth case study of actions undertaken by government agencies and officials in connection with the controversy that occurred over the use of synthetic organic pesticides from the period of their first initial widespread use in war-related efforts (mid-1940s) through the years immediately following the 1962 publication of Rachel Carson's Silent Spring (the 1960s). The theoretical arguments presented in this work were developed through an ethnographic content analysis of primary and secondary source material. Two primary lines of argument are advanced, one pertaining to the ability of government agencies and officials to influence the nature, dynamics, and outcomes of environmental controversies, the second pertaining to the direction of the influence. It is argued that government agencies and officials exercise an inordinate amount of influence over environmental controversies, due both to their symbiotic relationship with news media (which results in wider media dissemination of their claims and actions relative to those of other claimsmakers) and the fact that the state constitutes the primary institutional sphere through which solutions to environmental problems have been sought. A

content analysis of the New York Times' coverage of pesticides during the time immediately following the publication of Rachel Carson's Silent Spring (mid-1962 through 1964) documents the interdependent affiliation of government agencies and the news. With respect to the role of the state in environmental issues, most sociological work suggests that government agencies and officials respond to emerging or existing environmental controversies in ways designed to avoid, contain, or defuse those controversies. While these elements occur in the present case, there are also many instances where government actions contributed to conflict expansion. Theoretical insights drawn from institutionalist works on the state and the literature on agenda setting are used to explain how environmental controversies may actually create opportunities for government agencies and officials to advance organizational, career, and personal goals.

Dedicated to my sister,
LAUREN GUNTER BROOKS,
a most remarkable woman.

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Dr. Marvin E. Olsen served on my guidance committee until his untimely death in 1992. I am grateful for the enthusiasm Dr. Olsen expressed for my work while I was doing my comprehensive exams and completing my dissertation proposal. Dr. Olsen and I shared common interests in both environmental and political sociology, and I lament the fact that this dissertation has had to be completed without his counsel.

I am fortunate to have had the opportunity to work with two additional faculty members who were not on my dissertation committee. The first of these, Dr. Denton E. ("Spud") Morrison, served as my advisor the first two years I was at Michigan State. My initial interests in environmental sociology largely stem from several articles on the environmental movement by Dr. Morrison I read while working on my masters thesis at Texas A&M University. While Dr. Morrison chose not to continue on my committee in a formal capacity

following his retirement he has continued to be supportive of my research. The last two years I was at Michigan State I had the opportunity to work as a research assistant for Dr. Larry Busch. It is through this experience that I first began to develop an interest in agricultural science, an interest that receives some expression in this dissertation and that I hope to develop more fully in the future.

One of the most enjoyable aspects of my graduate school experience was interacting with fellow graduate students. I owe a big note of appreciation to all my MSU friends and the encouragement and support they provided, with a special word of thanks going to members of my dissertation support group -- Mike Cushion, Susan Joel, and Niahua Zhang. I would also like to thank my family, who have always supported my career decisions (although I am not certain they have always understood them).

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CHAPTER ONE

INTRODUCTION

The social and political landscape of the last three decades bears the unmistakable imprint of high levels of activism and concern over a host of environmental problems, including air and water pollution, toxic contamination, and the depletion of nonrenewable natural resources such as fossil fuels. As we might expect, attempts to define these conditions as "social problems" have not occurred within a controversy-free atmosphere. Consistent with other social problems controversies (cf., Spector and Kitsuse, 1977; Schneider, 1985; Best, 1989; Holstein and Miller, 1993), debates have raged over the severity (and sometimes even the existence) of these purportedly problematic conditions, their likely causes, and the viability and desirability of proffered solutions.

Efforts to understand such dimensions of these controversies as the actions, interactions, and reactions of claimsmakers, and the development of these controversies over

time, have yielded a rich array of research endeavors. Gamson and Modigliani (1989), for example, have traced the changing nature of "interpretive packages" used to understand and evaluate nuclear energy. Jasper (1988) has developed a model to explain how the nature and extent of media coverage of nuclear energy interacts with audience values to produce variable levels of support for nuclear energy both across time and within audiences at a particular point in time.

My goal in this dissertation is to contribute to this literature through an in-depth empirical and analytical exploration of the role played by government agencies and officials in the controversy that occurred over the use of synthetic organic pesticides such as DDT following their first initial widespread use during World War II and continuing through the years immediately following the 1962 publication of Silent Spring, Rachel Carson's well-known indictment of then-common pest control practices. Government officials and agencies are major actors in environmental controversies, and for this reason alone an exploration of the ways in which their claims and actions impact the nature, dynamics, and outcomes of these controversies is justified. However, there are two reasons to suspect that government agencies and officials may exercise an inordinate amount of influence over the ways in which these controversies are publicly defined. First, the relation between the state and news media is largely a symbiotic one (Molotch and Lester, 1974; Tuchman,

1978; Gans, 1979; Herman and Chomsky, 1988), meaning that government agencies and officials are more likely than other sets of claimsmakers to get their claims and actions disseminated through the news media. Second, in a twentieth century representative democracy such as we have in the United States, government forms the primary institutional sphere through which solutions to environmental problems are sought. If this assessment is a correct one, then understanding the claims and actions undertaken by government officials and agencies over the course of environmental controversies becomes particularly pressing.

Accomplishing this task requires not only a recognition of the reasons why government officials and agencies may exercise considerable influence over the nature, dynamics, and outcomes of environmental controversies but also addressing the question of the direction such influence is likely to take. A number of empirical studies of environmental controversies suggest that government agencies and officials have a general propensity to attempt to contain threatening or emerging environmental controversies and deflate, depoliticize, or defuse existing controversies (Molotch and Lester, 1975; Jasper, 1988; Clarke, 1989; Bogard, 1989; Reich, 1991; Lorenz, 1993). A possible explanation for such a propensity offered by the neo-marxist (Miliband, 1969; Poulantzas, 1973; Block, 1977; Schnaiberg, 1980; Marger, 1987; Schnaiberg and Gould, 1994) model of government is that the

state acts largely to protect and further the interests of business elites.

Reich's (1991; see also Lorenz, 1993) work on the contamination of the human food chain with the fire retardant polybrominated biphenyl (PBB) in Michigan provides an example of this type of explanation. According to Reich, the overriding concern of the Michigan Department of Agriculture following the discovery of PBB-contamination in 1974 (about a year after the contamination actually occurred) was to ensure Michigan agricultural interests were not severely impacted by the contamination. Molotch and Lester's (1975) work on the 1969 Santa Barbara oil spill also portrays federal agencies and officials coming to the defense of the powerful oil industry. Jasper's (1988) model on the political life cycle of technological controversies posits that government action that sends a message of reassurance that the concerns raised about a technology are being "looked into" or "taken care of" is an important factor moving the controversy toward depoliticalization.

We see this charge of agency capture by industry interests leveled by critics in contemporary pesticide controversies. The U.S. Department of Agriculture has been a particular target of this criticism (Carson, 1962a; van den Bosch, 1978), not surprising given that the USDA has historically been a major promoter of pesticides and part of a powerful subgovernment system that sought to exclude

involvement of other interests in pesticide policy (Bosso, 1987; Hansen, 1991). Such criticisms have also been levelled, however, at two other government agencies -- the U.S. Department of Interior and the Food and Drug Administration -- involved in pesticide research and regulation. Graham provides an example of criticism directed toward the former agency:

> The Department of the Interior also was dominated by men who saw themselves only as servants (or partners) of powerful businessmen. On the highest levels this attitude took the form of treating our natural resources simply as objects to be dumped on the marketplace; within the Bureau of Sport Fisheries and Wildlife it was reflected in dominance by the predator control people, who applied their poisons and steel traps at the bidding of ranchers and sheepherders. (1970:42)

Hynes (1989:96) provides an example of such a criticism directed toward the second agency. In reviewing the process whereby the Food and Drug Administration came in 1977 to set a tolerance level for PCBs in fish of 2 parts per million, she argues that this level was not "a strict reflection of a level meant to protect public health" (which, she argues, would have been better served by a tolerance level of 1 part per million), but rather took into consideration the economic impact of the ruling on the fishing industry.

Blodgett (1974) and Bosso's (1987) work on pesticide policy offers a counter understanding of the role of the U.S. Department of Interior (USDI) and the Food and Drug Administration (FDA) in the mid-century pesticide controversy. These authors portray these two agencies as much more actively

involved in promoting policies that would protect human health and the environment from unintended side effects of pesticide use, and in the process fighting to reduce the USDA's near monopoly over pesticide policy.

These works suggest that the impact of government officials and agencies on the nature, dynamics, and outcomes of environmental controversies might be more varied, complex, and subtle than that postulated by the conflict avoidance-containment-defusement model. My conviction that this latter model was not adequate in and of itself to explain the range of government responses during this controversy was further reinforced by my analysis of New York Times' coverage of the pesticide controversy that occurred in the years immediately following publication of Rachel Carson 's Silent Spring (mid-1962 through 1964). As I explain further in Chapter Five, the claims made by and actions undertaken by government agencies and officials during this time period served largely to reinforce Carson's concerns. Furthermore, the actions of at least some government officials seemed purposefully designed to keep the pesticide issue in the public limelight.

In this dissertation I use insights drawn from five literatures to develop an alternative theoretical accounting of the role of government agencies and officials in the mid-century (1944 through 1969) controversy over the use of synthetic organic pesticides. This theoretical accounting is not meant to replace, but rather to expand and modify, the

traditional conflict avoidance-containment-defusement model, as I explain further at the end of the section. The five literature utilized in this study are:

1. institutionalist perspectives on the state (Skocpol and Finegold, 1982; Skocpol, 1985; Buttel, 1985; Campbell, 1985; Hoberg, 1992; Carruthers, 1994);
2. agenda setting and issue-attention cycles (Downs, 1972; Mazur, 1981, 1991; Cobb and Elder, 1983; Kingdon, 1984, 1991; Jasper, 1988; Baumgartner and Jones, 1991);
3. media-government relations (Sigal, 1973; Tuchman, 1978, 1988; Gans, 1979; Herman and Chomsky, 1988);
4. social constructivists' work on social problems (Spector and Kitsuse, 1977; Best, 1989; Gamson and Modigliani, 1989; Holstein and Miller, 1993); and
5. conflict theory (Schnaiberg, 1980; Schnaiberg and Gould, 1994), with a particular emphasis on the more traditional conflict avoidance-containment-defusement model of government response to environmental controversies (Molotch and Lester, 1975; Schnaiberg, 1980; Jasper, 1988; Clarke, 1989; Bogard, 1989; Reich, 1991; Lorenz, 1993; Schnaiberg and Gould, 1994).

I turn now to an elaboration of this model.

The State and Environmental Controversies: An Alternative Perspective

Until recently, efforts by political sociologists and political scientists to understand the state and state-society relations were largely couched within some variant of the pluralist or neo-marxist models (Skocpol, 1985). Both of these models viewed the state as a conduit through which societal interests were transformed into public policy, with disagreement occurring over whether this conduit is available to a broad (pluralist) or narrow (neo-marxist) range of interests. More recently, the institutionalists have offered a third perspective on the state (Skocpol and Finegold, 1982; Skocpol, 1985; Buttel, 1985; Campbell, 1985; Hoberg, 1992; Carruthers, 1994). The institutionalists seek to understand the ways in which the component parts of the state operate as players in the political process. There are two primary routes by which various elements of the state apparatus may influence the policy process:

> The first, the state as institutional order, focuses on the organization of government institutions and the rules and procedures that govern their behavior... The second component of the institutionalist view, the state as officials in action, looks at the interests and activities of government officials in the creation and implementation of public policies. According to this version, government officials have their own preferences and the capacity to embody them in public policy. (Hoberg, 1992:10)

The institutionalist perspective suggests a more extensive range of responses government agencies and officials might make to environmental controversies than those indicated

by the conflict avoidance-containment-defusement model. Certainly one class of responses would fall along the lines of this latter model. Using the institutionalist perspective, for example, we would predict that government agencies will strive to avoid or deflate environmental controversies when such controversies threaten the resources, legitimacy, and/or autonomy of those agencies. Resources are threatened when agencies are required to take on additional responsibilities without a corresponding increase in personnel and budget. Case studies by Kroll-Smith and Couch (1990) and Reich (1991) indicate that government agencies are often reluctant to take primary responsibility for technological disasters, especially in cases where agency jurisdiction is ambiguous, in part because of the tremendous costs imposed by those disasters.

Government agencies and officials may seek to contain or defuse an environmental controversy in order to avoid public panic, even the hint of which typically strikes fear in the heart of state personnel. Edelstein (1988) reports that government officials' warn communities of environmental hazards (such as contaminated ground water) in a ways that do not incite public panic. Their efforts to both caution and reassure result in the public receiving the mixed message of "Your environment is safe" and "Your environment is not safe".

Claims that a government agency has failed to adequately protect the public from some environmental or technological hazard may result in closer scrutiny of the agency by the

media, Congress, interest groups, and the public, and a corresponding reduction in agency autonomy, outcomes agencies seek vigorously to avoid (Downs, 1966). Ironically, state failure to respond quickly and decisively to an environmental controversy or crisis may have the unintended consequence of prolonging the conflict and threatening the agency's legitimacy. Reich (1991), for example, reports how the general failure of the Japanese government to either provide medical care or compensation to victims who had unwittingly consumed rice oil contaminated with PCBs, or prosecute the offending company, resulted in organizational, protest, and legal activity on the part of some victims that continued for almost 20 years.

On the other hand, in some cases environmental crises and controversies may present government agencies and officials with opportunities for pursuing organizational, career, and personal goals. Agencies may use such crises to garner increased resources through research and/or added enforcement to address the crises, and/or expand their sphere of bureaucratic influence. Elected officials may engage in "newsworthy" responses to the crisis or controversy such as scheduling special Congressional hearings that bolster their own public images and hence careers (Edelman, 1964). Finally, since some government agencies have close historical connections with particular social movements (Gale, 1986), we would expect at least some of the bureaucrats in those

agencies to adhere to movement ideologies regarding just, fair, and desirable social conditions (Morrison, forthcoming); environmental controversies may provide opportunities for these bureaucrats to sponsor policies that embody these personal goals.

In contrast to expectations of the conflict avoidance-containment-defusement model, viewing the state as a set of institutional arrangements suggests that government agencies may in some cases be among the initiators of environmental controversies, though an agency's involvement in such a role may be inadvertent. As Kingdon (1984) informs us, government agencies routinely generate and/or collect a range of indicators reporting on the performance of whatever part of the world falls under their jurisdictional purview. One way such indicators are generated in the consumer and environmental realm is through tests conducted in accordance with regulatory mandates. Government agencies may interpret changes in these indicators as signs of an existing or impending social problem, and respond accordingly. In his study of the U.S. nuclear energy industry, for example, Campbell (1985) reports how some of the scientists within the Atomic Energy Commission charged with regulating the safety of nuclear reactors became convinced through the process of performing their jobs that existing standards were not adequate to ensure safety. When the agency failed to respond to their concerns these scientists leaked studies and other

information to such watch-dog groups as the Union of Concerned Scientists, and thus played an early and instrumental role in the development of the anti-nuclear movement.[1]

A concept drawn from the agenda setting literature, that of "softening up", illuminates the potential impact of problem detection via government monitoring activities on the subsequent development of an environmental controversy. According to Kingdon (1984), new items (issues or problem areas, as well as policy responses to those issues) tend to be added to the political agenda, or moved to a higher agenda status, only after a (sometimes considerable) period of 'softening up'. The softening up period is characterized by a few dedicated claimsmakers presenting evidence to support their claims that some condition is problematic and in need of remedial action from government. We see the importance Kingdon attributes to softening up in the overall policy process in the following:

> Softening up seems to be necessary before a proposal is taken seriously. Many good proposals have fallen on deaf ears because they arrived before the general public, the specialized publics, or the policy community were ready to listen. (1984:137)

Dissemination of government-generated indicators of a (potentially) problematic condition through popular media sources may play an important role in softening up the public

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[1] The AEC scientists were not opposed to nuclear energy per se, only what they perceived as the failure of private industry and the government to provide adequate public safeguards.

and relevant policy community, thereby facilitating the labelling of the condition as a social problem. Once the problem has been successfully placed on the political agenda, government response to that problem is likely to be shaped by pre-existing, softened-up proposals. In other words, as I have previously argued an environmental controversy may present government officials and agencies (as well as other political actors) an opportunity to advance desired policy changes that predate the onset of the controversy. The brief time issues and problems generally maintain high agenda placement (Downs, 1972; Kingdon, 1984) make the successful development and promotion of policy responses in the wake of controversy exceedingly difficult, providing another advantage to actors who enter the controversy with already softened-up proposals.

In this dissertation I use these theoretical insights to illustrate ways in which government agencies and officials contributed to, and took advantage of, the controversy over synthetic organic pesticides in the 1940s, 1950s, and 1960s. As I have previously indicated, these theoretical developments are intended to modify and extend, rather than counter, the conflict avoidance-containment-defusement model of state action. Indeed, there are two important ways in which the present case affords partial support for this model. First, there were certainly some elements of the state apparatus, particularly the U.S. Department of Agriculture and

Congressional Agricultural Committees and Subcommittees, who largely acted in ways consistent with the conflict avoidance-containment-defusement model, including the defense of existing pesticide policy against changes sought by pesticide critics (Graham, 1970; Blodgett, 1974; Dunlap, 1976, 1981; van den Bosch, 1978; Bosso, 1987; Hynes, 1989).

Second, while the nature and dynamics of this controversy only partially conform to the avoidance-containment-defusement model, the outcomes do reflect the model's predictions. The outcome of the post-Silent Spring pesticide controversy conforms to the pattern suggested by Jasper (1988), where government officials help to defuse controversy by engaging in publicly visible actions that send a message of reassurance that "the problem has been (or is being) taken care of". The institutionalist perspective on the state and conflict theory allows us to make interpretive sense of this finding. While some government agencies and officials may seek to take advantage of the opportunities created by environmental crises and controversies over the short term, over the longer term they encounter mounting pressure to reach some type of resolution. Lack of some type of definitive government response to an environmental controversy such as the present one which has high media and public visibility is likely to result in tarnished images of both the efficacy and legitimacy of involved officials and agencies. That some type of resolution or definitive response is not immediately

forthcoming stems from political forces opposed to change; if these forces are powerful enough they may stymie any but the most minimal and symbolic of responses. The conflict avoidance-containment-defusement model thus has much of value to tell us about environmental controversies, and may display considerable robustness in explaining the depoliticalization of these conflicts.

ORGANIZATION OF STUDY

The case study analysis reported in this dissertation was developed through the use of ethnographic content analysis (ECA) (Altheide, 1987), a technique which applies the inductive research strategies of grounded theory (Glaser and Strauss, 1967; Charmaz, 1983; Strauss and Corbin, 1990) to documentary material. Like all forms of grounded theory, ECA constitutes an iterative research strategy, where the researcher continually moves between data gathering, data analysis, and conceptual development. The end product of such an analysis is the development of a coherent theoretical framework that specifies the ways in which the key components of the case are linked, together with more general explanations of why those particular relationships occurred in the way they did. In the first part of this chapter I presented the theoretical framework that was developed through the use of ECA in the present case.

Because grounded theory uses a circular approach rather than the more conventional linear research strategy, it makes

the presentation of material in neatly demarcated "theory" and "methods" chapters problematic. Accordingly, in the following two chapters I present this material in a slightly unconventional form. I have organized these chapters to cover the pertinent theoretical and methodological literatures, but in a way that more accurately captures the actual progression of this research project.

In Chapter Two I compare and contrast hypothetico-deductive and grounded research strategies, and also overview the primary and secondary data sources used in this dissertation. I conclude Chapter Two by presenting some criteria for evaluating my case study analysis.

Chapter Three is entitled "Development of the Research Project and Literature Review", and as that title suggests is designed to simultaneously address two different goals. The first of these is to illustrate the ways in which grounded research techniques were utilized in the present project. Because grounded theory is an inductive, emergent, and iterative research strategy, accomplishing this first goal requires explaining the way in which the research project developed over time. To address this issue I overview the ways in which my understanding of this particular environmental controversy changed as I gained increased familiarity with the details of the case and with the various theoretical literatures utilized to analyze the case.

The second goal of Chapter Three is to provide a more extensive review of the various theoretical literatures presented in the first section of this chapter. I undertake this review with a twofold aim: first, to provide readers with a general introduction to these literatures, and second, to illustrate how these literatures were utilized in the development of this project. In order to meet this latter aim I organize presentation of these literatures in Chapter Three in a temporal manner, that is, I begin with the bodies of literature I first used to analyze the case, then move on to literatures subsequently employed in that endeavor. The topics I cover in this chapter are: social constructivism, conflict theory, news media, agenda setting, Jasper's model of technological controversies, and institutionalist perspectives on the state.

In Chapters Four and Five I present the findings from my case study analysis. Chapter Four opens with a brief history of pesticides in the U.S. and then overviews the major actors involved in pesticide controversies. I next discuss the types of institutionalized monitoring mechanisms in place at the USDA and FDA in the 1940s, and subsequently established in the U.S. Department of Interior in the late 1940s and into the 1950s, and how these monitoring mechanisms resulted in these agencies' early detection of potential problems with the new synthetic organics when they were introduced during World War II. In the remainder of that chapter I discuss New York

Times' coverage of, and policy battles over, the new synthetic organics in the pre-Silent Spring era (1944-1961).

Chapter Five continues the case study analysis, examining New York Times' coverage and policy battles in the aftermath of Silent Spring (1962-1969). In most of the chapter I focus on the two-and-a-half years (mid-1962 through 1964) of intense media and government scrutiny of pesticides following the 1962 publication of Silent Spring. I begin the chapter with a brief discussion of Carson's work and the impact it had on the post-World War II pesticide controversy. Next, I illustrate how, during the time period mid-1962--1964, the New York Times constructed the federal government as the primary arena within which responses to the claims and concerns raised by Carson were to occur. I follow this with an indepth discussion of the major types of responses undertaken by the federal government and how these were portrayed in the New York Times. In the final section of the chapter I provide a brief overview of events and media coverage in the remainder of that decade (1965-1969).

In Chapter Six I present the conclusions to this study. I open the chapter with a discussion of major findings and theoretical contributions of this research. I next overview weaknesses and drawbacks of the study, and then close the chapter by overviewing some directions for future research suggested by this work.

CHAPTER TWO

RESEARCH STRATEGY AND DATA SOURCES

In this chapter I compare and contrast hypothetico-deductive and grounded research strategies, as well as overview the primary and secondary data sources used in this dissertation. I conclude this chapter by presenting some criteria for evaluating my case study analysis.

RESEARCH STRATEGY

Methodologically, this project follows the precepts of ethnographic content analysis (ECA) (Altheide, 1987), which applies more inductively oriented grounded theory techniques (Glaser and Strauss, 1967; Charmaz, 1983; Strauss and Corbin, 1990) to documentary materials. In the discussion that follows I compare and contrast grounded theory techniques with the more conventional hypothetico-deductive research strategy. In the following chapter I provide a detailed description of how I employed grounded techniques in the development of the research project reported in this dissertation.

Through research, sociologists seek to establish the degree of correspondence between theoretical models and the empirical world. Both hypothetico-deductive and grounded

techniques make use of theoretical models, but the way in which these models enter into the research process differs. In hypothetico-deductive approaches, theory is the starting point of a research project, while in grounded approaches theory is the end-product of a research project. The purpose of hypothetico-deductive techniques is to empirically test one or more of the numerous theoretical models already in existence (Greer, 1969; Chafetz, 1978). The purpose of grounded techniques is to develop new theoretical understandings of some aspect of the social world when existing models do not seem to fit (Glaser and Strauss, 1967).

The logic of the hypothetico-deductive approach is as follows: if a given theoretical model has correctly identified the nature of the interrelationships among a number of social processes or elements, then a researcher using that model should be able to accurately predict the outcome of situations where those elements are present. These predictive statements are known as hypotheses. Hypotheses restate propositions, or the abstract relational statements found in theoretical models, into forms that are empirically testable. A propositional statement from the theoretical framework of human ecology states that, "Power in an ecosystem is disproportionately concentrated in the key function [i.e., the institutional arrangements that mediate exchanges between social systems and their natural environments] and diminishes with each degree of removal from direct access to environment"

(Hawley, 1986:44).

One of the most important environmental inputs in industrial societies is that of energy, hence, those groups and organizations in society in charge of extracting, generating, refining and distributing energy constitutes a "key function" in those societies (Adams, 1975). An example of one testable hypothesis that can be derived from this particular propositional statement, then, is "Governmental energy policies will more extensively reflect the interests of energy industries than of energy consumers." Actual testing of this hypothesis would require operationalization of these variables, for example, examining the extent to which government policies subsidize (either directly or through tax write-offs) development of energy sources that provide the maximum return to energy industries versus those that minimize the energy costs of consumers.

In grounded approaches, in contrast, the researcher begins with an extensive examination of some empirical phenomenon of interest and then develops a theoretical framework to explain that phenomenon (Glaser and Strauss, 1967; Charmaz, 1983; Strauss and Corbin, 1990). Hypothetico-deductive techniques present a more linear research trajectory, as the researcher moves from theory to hypotheses to operationalization of variables to construction of a sample frame to data gathering to data analyses. In contrast, the research trajectory in grounded theory approaches is circular

in nature, with the researcher continually moving back and forth among data collection, concept formation, and analysis or theory construction (Charmaz, 1983; Altheide, 1987).

In the initial stages of a research project using grounded techniques, the researcher typically has few preconceived notions about either what comprises the key component parts (e.g., events, organizational structures, personal or organizational networks, attitudes, values, belief systems) of the particular empirical case under investigation, nor how those parts are interrelated. While ECA may begin with some initial research questions and "variables" derived from literatures of interest, these are only to be used as guides to research and not adhered to in a rigid fashion (Altheide, 1987).

Increased familiarity with the case allows the researcher to begin to identify these components, and to form tentative hypotheses about how they are linked together. Further examination of the data is then undertaken to see if these hunches hold up under more intensive scrutiny; such scrutiny is likely to lead to additional insights into the relationships between various components of the case. The final stage of this process is reached when the researcher develops a coherent theoretical framework that specifies the way in which the key components of the case are linked, together with more general explanations of why those particular relationships occurred in the way that they did.

Numerous iterations of the data gathering--data analysis--theoretical development cycle may be necessary before such a coherent framework can be constructed. This theoretical framework constitutes one of the major "research findings" whose applicability to the case under question must be defended.

DATA SOURCES

In this section I discuss the data sources used in the present research project. Because this research is historical in nature, all information reported in Chapters Four and Five comes from published documentary material. In historical research, a distinction is made between secondary and primary sources. Secondary sources refer to materials reporting research already conducted on a given topic, the findings of which can be utilized in subsequent investigations (Stewart, 1984). Examples of secondary sources include the census, other government documents reporting research data/findings, financial analyses, and monograms reporting the findings of scientific research. Primary sources refer to all those materials used by a researcher in conducting original analysis on a topic (Shafer, 1980). Examples of primary sources include diaries, magazine articles, and minutes from city council meetings. In the present research project I utilize both secondary data sources (previous social scientific analyses of pesticides), and primary sources, including industry literature, environmentalists' literature, mass media sources,

and Congressional Committee and Subcommittee hearings. In the following two sections I discuss the kinds of primary and secondary sources used in the present study as well as address potential problems of reliability posed by the use of these particular sources.

Primary Sources

In this section I discuss the four types of primary sources utilized in this study: industry literature, environmentalist literature, government literature, and popular news media literature. Within each of these broad classifications I survey the particular publications I examined in this study, the manner I went about locating these sources, and potential shortcomings of these sources.

Industry Literature. As I discuss further in Chapter Three, when I began this project my initial focus was on the claims made by and actions undertaken by the chemical industry and environmentalists in the immediate aftermath of Silent Spring (mid-1962--1965), and the dissemination of these claims and actions in popular media sources. Following my early discovery that dissemination of claims by the chemical industry through one popular news source, the New York Times, was quite minimal, and the simultaneous discovery that this source provided extensive coverage of the claims and actions of government officials and agencies, I reoriented the focus of my study toward an analysis of the role of the state in this controversy. As a result, industry literature is not

utilized extensively in the case study analysis reported in Chapters Four and Five. Since it does, however, provide part of my background working knowledge of this controversy, and since I report some of my early findings from this literature in Chapter Three, it is still pertinent that I describe the industry sources I examined.

I conducted a systematic analysis of pesticide-related articles published in two industry trade journals -- the Oil, Paint and Drug Reporter and Farm Chemicals -- during the period immediately following the publication of Silent Spring (mid-1962 through 1965). The Oil, Paint and Drug Reporter is one of the chemical and allied industries major trade journals. It is written for "[b]uyers and sellers of chemicals, oils and drugs" and covers "[m]aterial prices, plant facilities, legislation, processes, [and] marketing reports" (Oxford Publishing Group, 1964:87). The Oil, Paint and Drug Reporter is published weekly. Farm Chemicals is the monthly publication of the National Agricultural Chemicals Association (NACA). The major trade association for the agri-chemical industry, NACA is headquartered in Washington, D.C. It was founded in 1934, and in 1968 had 139 members (consisting of firms producing agri-chemical products) and 12 staff (Gale Research Company, 1968). NACA played an important role as defender of pesticides in the aftermath of Carson's Silent Spring (Bosso, 1987).

Articles related to the post-World War II pesticide

controversy published in the Oil, Paint and Drug Reporter were identified through use of the Business Periodicals Index and relevant articles in Farm Chemicals were identified through the Biological and Agricultural Index. In all cases where indexes were used to identify pesticide-related articles a number of subject headings were searched, including: Carson, Rachel; DDT (examined because it was the best-known and most visible of the synthetic organic pesticides at the time period of this study); insecticides; National Agricultural Chemical Association; pesticides; and Silent Spring. Most of the articles identified through these searches were located under the heading of "pesticides". This search yielded 75 articles from the Oil, Paint and Drug Reporter and 44 from Farm Chemicals published over the time period of mid-1962 through 1965.

Trade journals are an important means of intra-industry communication, one of the main mechanisms by which news relevant to the industry is disseminated. Information typically covered in trade journals includes reports on current market conditions for various industry products, new product developments, any changes in federal and possibly state policy that might impact the industry as a whole or at least some of the industry's markets, and any other changes in the broader society that might positively or negatively impact industry sales. An outbreak in some insect-borne disease, for example, might very well be reported in an industry trade

journal, particularly if such an outbreak was likely to lead to an increased demand for pesticides to fight that insect vector.

The trade journals were an important forum through which industry expressed its response to Carson's work, and spelled out the strategy they would use to respond to that threat. While trade journals do present a readily available source of industry activity at this time period, their use also presents a potential shortcoming in that it is unlikely that these trade journals contain the totality of industry's response to Carson. They do not, for example, report on informal discussions or private conferences held by industry members, or record any confidential memos that might have been circulated at the time. However, even given these limitations, the trade journals still provide a valuable source of information on the claims about Carson's work industry was trying to gain a high level of public visibility, and on industry's response to various pieces of pesticide-related legislation that were being proposed over this time period.

Environmentalist Literature. The environmentalist literature examined in this study included Rachel Carson's Silent Spring (1962a), excerpts from Silent Spring published in three consecutive editions of the New Yorker magazine in June, 1962 (1962b, 1962c, 1962d), several movement-sympathetic accounts of this controversy (Graham, 1970; Hynes, 1989; Lear,

1993), and 37 articles from Audubon Magazine on pesticides published between August, 1962 and December, 1965. The work of Carson (1962a, 1962b, 1962cc, 1962d), Graham (1970), Hynes (1989), and Lear (1993) provided information on the concerns environmentalists were raising with respect to pesticides at this time. The Audubon Magazine, a bi-monthly publication of the National Audubon Society, provided information on government policies being advanced to address "the pesticide problem" and the Society's position on those policies. The Audubon Magazine is indexed in the Reader's Guide to Periodical Literature, and I originally used this index in my attempt to locate pesticide-related articles in the magazine. It quickly became apparent, however, that some of the magazine's regular features, such as the "National Capital Report" and "The Editorial Trail", at least on occasion carried information crucial to my own research questions that was not indexed in the Reader's Guide. I ended up, therefore, locating relevant articles through a page-by-page search of every issue of the magazine published between July, 1962 and December, 1965.

Potential shortcomings in the use of these sources is the same encountered with the use of the chemical industry trade journals: these sources are not likely to report all of the activities or concerns of environmentalists over this time period. On the other hand, given that my focus is on claims that the environmentalists are striving to make public, and

policies they are trying to get enforced or implemented, these sources, even given these shortcomings, are adequate for the task at hand.

Government Literature. I used the Monthly Catalogue to identify Congressional Committee and Subcommittee hearings on pesticides held over the time period 1944 through 1969. I examined the following Congressional hearings:

(1) Hearings Before the House Select Committee to Investigate the Use of Chemicals in Food Products, House of Representatives, 81st Congress, 2nd Session, 1951 (U.S. Congress, 1951a).

(2) Hearings Before the House Select Committee to Investigate the Use of Chemicals in Food Products, 82nd Congress, 1st Session, 1951 (U.S. Congress, 1951b).

(3) Hearings Before a Subcommittee of the Committee on Interstate and Foreign Commerce, United States Senate, 85th Congress, 2nd Session, 1958 (U.S. Congress, 1958).

(4) Hearings Before the Subcommittee on Fisheries and Wildlife Conservation of the Committee on Merchant Marine and Fisheries, House of Representatives, 86th Congress, 2nd Session, 1959 (U.S. Congress, 1960).

(5) Hearings Before the Subcommittee on Reorganization and International Organizations of the Committee on

Government Operations, United States Senate, 88th Congress, 1st Session, 1964 (U.S. Congress, 1964).

Mass Media Sources. The term "mass media" designates information designed for dissemination to and consumption by mass audiences, either through print or electronic media (television and radio). A number of different types of publications and programs are subsumed under this general heading, including nightly news broadcasts (such as National Public Radio's All Things Considered) and newspapers (such as the Chicago Tribune), weekly news magazines (such as Time and the U.S. News and World Report) and weekly news shows (such as Frontline), family and general interest magazines (such as the Reader's Digest and Life), and a variety of hobby and special interest programs (such as The Frugal Gourmet and This Old House) and publications (such as Sports Illustrated, the Flower Grower, and Science News Letter).

The question of which of these mass media sources to select for careful examination was guided by the purpose of the research project under question. The goal of the present study is to determine the role media coverage played in terms of entering pesticide use onto the government and public agenda and in terms of subsequent debates about policy alternatives to address the "pesticide problem". Those media sources most pertinent to providing the kind of information needed to adequately address these research questions are the leading national news sources: the major networks' nightly

news broadcast and other television news and radio programs and specials, the weekly news magazines (Time, Newsweek, and U.S. News and World Report), major newspapers (such as the New York Times, the Chicago Tribune, and the Washington Post), and other magazines with extensive political commentary (such as The New Republic and The Atlantic). These are the media sources that provide the most extensive coverage of the actions of federal officials.

Out of these sources, the one I chose for systematic analysis was the New York Times. Several factors underlie this choice. I decided to examine print rather than electronic (television and radio) news for the simple pragmatic reason of the much greater availability of printed sources from this time period, and indexes allowing for ready access to these sources. I also wanted the primary focus of my analysis to be on those publications who defined their primary purpose as the "objective" reporting of news events (e.g., who did and said what, when, where, and how) rather than on political commentary of those events. Third, the New York Times is listed among the most important news sources in the country, and is considered by some analysts as the nation's highest-quality newspaper (Hulteng and Nelson, 1971). Mazur (1991), for example, regards the New York Times as a premier agenda setter among news media, with stories frequently breaking first in the New York Times then subsequently picked up by other news outlets.

Fourth, coverage of pesticides in this source was extensive enough to permit meaningful qualitative and quantitative analysis. The much lower rate of coverage found in the three major newsweeklies (Newsweek, Time, and the U.S. News & World Report), as well as in the quasi-news source the Reader's Digest, make use of these sources for systematic analysis more problematic. For example, 66 articles on pesticides were published in these four sources over the 25 year period 1944 through 1968, or an average of 2.6 articles per year for all these sources, or less than one (.65) article per year for each source. I do use these sources to provide an indication of the movement of pesticides onto and off of the public agenda (see Figure 1, Chapter Four). Indeed, as weekly (or, in the case of the Reader's Digest, monthly) publications with much more limited page space than the daily New York Times, we would expect these publications to allocate space to pesticide stories only during times of high public visibility and government activity.

I used the Reader's Guide to Periodic Literature to identify pesticide-related articles published in the three newsweeklies and the Reader's Digest over the time period 1944-1969. I located pesticide-related articles in the New York Times through the use of the New York Times index. I searched under the same topic headings reported in the section on industry literature. These were: Carson, Rachel; DDT (examined because it was the best-known and most visible of

the synthetic organic pesticides at the time period of this study); insecticides; National Agricultural Chemical Association; pesticides; and Silent Spring.

I initially examined 165 pesticide-related articles published in the New York Times between mid-1962 and 1965. For reasons I explain in the following chapter, I subsequently extended that analysis to include 228 articles on DDT published in the New York Times between 1944 and 1961. I also came to focus my systematic analysis of post-Silent Spring coverage on the 142 pesticide-related articles published in the New York Times between mid-1962 and 1964, this period representing the most intensive period of media and government scrutiny. I also examined New York Times coverage of pesticides from 1965 through 1969 to ensure that coverage did not offer counter evidence to the theoretical explanation developed on the basis of the period of intensive coverage.

A final issue that must be addressed is the extent to which the New York Times can be considered to be representative of mass media more generally at this time. Given the diversity in media sources, as discussed above, it is likely that there is no source that can be said to be "representative" of the mass media as a whole. However, the New York Times does represent one of the nation's leading print news media, and hence represents an important element of the agenda-setting process (Mazur, 1991).

Secondary Sources

In the present research project several secondary sources were used, including books and journal articles reporting on social scientific research on pesticides conducted by historians and political scientists (Whorton, 1974; Blodgett, 1974; Dunlap, 1976, 1981; Perkins, 1978; Lutts, 1985; Bosso, 1987; Russell, 1993). Secondary sources allow a researcher to gain familiarity with the key events, participants, and claims of a particular case in a much faster and efficacious manner than if he or she had to do reconstruct that information solely from primary sources and personal interviews. Skocpol (1979) and Greenberg (1988) argue for the value of sociologists' use of secondary sources. They maintain that it is a useful division of labor for historians to write descriptive histories of particular times and events, and for sociologists then to use those descriptive histories in the much more analytical task of developing, testing, and refining particular theoretical models.

In the following chapter I overview the development of this research project. When I began this project I was interested primarily in conducting an analysis of popular media coverage of pesticides claimsmaking in the aftermath of Silent Spring. As I explain further in Chapter Three, in the process of conducting this analysis I came to identify the pervasiveness of federal claimsmakers in New York Times' coverage of the post-Silent Spring pesticide controversy. As

a result of this discovery, my attention shifted to a focus on the claims and actions undertaken by federal claimsmakers; the secondary sources reported above provided valuable information in developing this part of the project, and in helping me interpret the findings from my media analysis.

Sociologists who use secondary sources are not absolved of the need to address questions pertaining to the accuracy and quality, or the reliability and validity, of the research reported in the secondary sources. Stewart (1984) maintains that the best safeguard against use of inaccurate secondary sources is to check the consistency of information reported in any one source with other sources. In the present project, I utilized a number of both secondary and primary sources and hence was able to cross-check information across these different sources. Furthermore, because the secondary sources I utilized were historical in nature they contained a wealth of descriptive information (as opposed to secondary sources that present findings in summary form, such as the U.S. Census). There were no significant discrepancies in the descriptive information provided by these various sources.

Discrepancies did exist in terms of interpretations of various events, actions, claims, pesticide uses, etc. To give one specific example, secondary sources were in agreement that the U.S. Department of Agriculture sprayed millions of acres of forests in the northeastern U.S. in the latter half of the 1950s in a campaign against the destructive gypsy moth.

Contending claims about the impacts of this spray campaign were made by the USDA, who saw destruction of wildlife as minimal and well worth the benefits gained from the spray campaign, and environmentalists and the U.S. Fish and Wildlife Service, who saw costs of the campaign in terms of destruction of aquatic life, wildlife and domestic animals, and the threat to human health, outweighing any benefits of the campaign. These discrepancies were treated within the social constructivist framework as contending claims.

EVALUATIVE CRITERIA

Regardless of the research strategy used, all research projects must develop means to counter potential problems of researcher bias, that is, the selective examination and presentation of only that empirical evidence that supports the researcher's theoretical model. Bias may be intentionally or unintentionally introduced into a research project via sampling decisions or question wording. One means I used to avoid potential sources of bias in the present work was to examine a wide range of secondary and primary sources on this controversy, as I indicated in the previous section. Using this wide range of literature helped to ensure that I was not only reporting the interpretation of this controversy of one set of claimsmakers.

One of the major mechanisms scientists have developed to combat potential sources of bias is to conduct research in a way that is reproducible by other investigators. Some

qualification of this concept of reproducibility must be made, however, when it is discussed within the context of grounded theory research. It is probably not likely that another researcher, starting from scratch and exploring exactly the same documentary material I explored but without knowledge of the theoretical framework I developed over the course of my research (presented in Chapter One) would develop exactly the same theoretical analysis as I have. The theoretical framework I developed hardly constitutes an exhaustive accounting of all the events occurring in this case. The following statement Gans (1979:6) makes about analysis of news media is particularly pertinent here: "News, like other kinds of symbolic fare, consists of innumerable bits of explicit and implicit content, and no single content analysis can grasp them all." Certainly there are other aspects of this controversy that could be addressed in much greater depth than I have done in this analysis, for example, the way that risk was constructed by various claimsmakers (including the mass media) or the role that scientists and science played in the controversy; other researchers undertaking their own ethnographic content analysis of this case might well choose to highlight these other elements.

The pertinent question at this point, then, is not whether subsequent studies might be conducted that would present additional understandings of this case, but whether such studies would present contrary interpretations to the one

given here. To help ensure reliability in this kind of research project, it is important that the researcher continually ask herself throughout the duration of the research project not only, "What sorts of evidence would support this theoretical framework?" but also "What sorts of evidence would undermine the applicability of this theoretical framework to this case?" (Kirk and Miller, 1986). In the following chapter where I overview the development of this project I indicate a number of instances in which my empirical findings were contrary to my initial expectations, and which led to various modifications in my theoretical understandings of this case. Indeed, any selective coverage of sources, claimsmakers, claims, events, etc. is contrary to the overall ethos of grounded techniques, whose goal is to make the theory fit the data not the data fit the theory.

The final point I will address in this chapter with respect to reliability is that of conceptual versus phenomenal equivalence (see Przeworski and Teune, 1970). Such considerations are especially important in case study research, particularly when we move to questions of case comparison and theory construction based on those comparisons (Ragin, 1987). Conceptual equivalence pertains to making sure that a concept has the same meaning across cases. For example, if we were interested in studying factors impinging on the decision processes of heads of state scholars would likely consider it appropriate to include the President of the

U.S. and King Hussein of Jordan in our study but not Queen Elizabeth of England. In other words, while Queen Elizabeth constitutes a symbolic head of state the meaning of that concept within the British context is not equivalent to the meaning found within the U.S. or Jordanian context. Phenomenal equivalence pertains to making sure that an indicator validly taps the empirical phenomenon we are studying. When conducting case study research it is particularly important to realize that an indicator that may validly tap a concept in one place and/or at one point in time may be totally inappropriate in another place and/or at another point in time. For example, access to cable television may be an appropriate indicator of level of urbanization in the contemporary U.S. but not in contemporary Africa. When addressed within the context of grounded theory, conceptual and phenomenal equivalence cautions researchers using that technique to provide clear definitions of their conceptual categories and the empirical indicators of those categories, and to use conceptual labels in ways consistent with current literature.

CHAPTER THREE

DEVELOPMENT OF THE RESEARCH PROJECT AND LITERATURE REVIEW

The findings and theoretical analysis presented in this dissertation were developed through the use of grounded research techniques (Glaser and Strauss, 1967; Charmaz, 1983; Altheide, 1987; Strauss and Corbin, 1990). In the preceding chapter I provided a general overview of the logic of grounded theory as a research strategy. In the present chapter I seek to accomplish two interrelated goals. First, I illustrate the ways in which grounded research techniques were utilized in the present project. Because grounded theory is an inductive, emergent, and iterative research strategy, accomplishing this first goal requires explaining the way in which the research project developed over time. To address this issue I overview the ways in which my understanding of this particular environmental controversy changed as I gained increased familiarity with the details of the case and with various theoretical literatures relevant to the case.

The second goal of this chapter is to provide a more

extensive review of these various theoretical literatures than that given in Chapter One. I present this review with a twofold aim: first, to provide readers with a general introduction to these literatures, and second, to illustrate how these literatures were utilized in the development of this project. In order to meet this latter aim I have organized presentation of these literatures in a temporal manner, that is, I begin with the bodies of literature I first used to analyze this case, then move on to literatures subsequently used in that endeavor. The topics I cover in this chapter are: social constructivism, conflict theory, news media, agenda setting, Jasper's model of technological controversies, and institutionalist perspectives on the state.

SOCIAL CONSTRUCTIVISM

I began this project with three general research questions derived from social constructivists' work on social problems and one hypothesis derived from the work of conflict theorists on the mass media. I discuss the social constructivist perspective in this section and conflict theory in the following section.

As a general approach to the study of human social life, social constructivism focuses on the processes by which humans create and reproduce (1) the institutional arrangements that guide and organize social action, and (2) the interpretive frameworks through which humans make sense of, and give meaning to, their social world (Berger and Luckmann, 1967).

Applied to the study of social problems, this perspective takes as its central concern the definitional activities (including the formation and utilization of organizations to promote particular claims) by which certain conditions (or alleged conditions) come to be labelled as "social problems" (Spector and Kitsuse, 1977; Schneider, 1985; Best, 1989). Such an approach is contrasted by its advocates with earlier "objectivist" approaches (including both functionalism and conflict theory), which focus more extensively on the problematic condition itself. These objectivist approaches define social problems as any condition that adversely impacts a large number of people. For the objectivists, it is the **condition** that constitutes the social problem. For the constructivists, a social problem becomes constituted through **the definitional activities of claimsmakers.**

Examples of the kinds of research questions pursued by social constructivists include:

> What sorts of claims get made? When do claims get made, and what sort of people make them? What sorts of responses do claims receive, and under what conditions? (Best, 1989:xix)

One central issue of concern to the social constructivists is the way in which social problems come to be typified, or viewed as problems of a particular sort (e.g., political economic, religious, moral, etc.). Typifications indicate which individuals and/or institutions in society are to blame for the condition, what types of changes will have to be made if the condition is to be ameliorated, and who in

society will bear the costs of those changes. Erchack and Rosenfeld (1989), for example, trace the historical process whereby learning disabilities came to be typified as a medical problem. They argue that such typification occurred not because there was strong empirical evidence that learning disabilities in fact had a physiological basis but because such typification served the needs of both the medical community and middle class parents with learning disabled children. For the medical community, typifying learning disabilities as a medical problem expanded their sphere of influence. For middle class parents, tracing the cause of learning disabilities to physiological factors meant that neither the child nor the parents could be held responsible for the condition.

The importance of the typification process is outlined in the following quotation:

> People will see a problem quite differently if it is put into one category rather than another. Thus, much of the struggle over problem definition centers on the categories that will be used and the ways they will be used... [a category] structures people's perceptions of the problem in many important respects. (Kingdon, 1984:117)

I began this case study analysis, then, with the following three research questions derived from the social constructivist perspective:

> Research Question 1: What claims about pesticides were made by the chemical industry and Rachel Carson and the environmentalists as well as other participants (e.g., scientists, government officials) in this controversy in the immediate aftermath of Silent Spring?

Research Questions 2: What solutions to the "pesticide problem" were advocated by the chemical industry, by Rachel Carson and the environmentalists, and by other participants?

Research Question 3: What were the particular constructions of the pesticide problem, and its solutions, that appeared in the New York Times? To what extent did these claims and solutions reflect the ones advocated by the chemical industry, Rachel Carson and the environmentalists, and other participants?

To state the matter somewhat differently, my initial concern was on examining: (1) the claims about, and typifications of, the pesticide problem, with a particular focus on claims and typifications of one of the major groups of supporters (the chemical industry) and one of the major groups of critics of pesticides (Rachel Carson and the environmentalists), (2) dissemination of these claims and typifications in the popular media, and (3) more generally the way in which the pesticide problem was being constructed in the popular media.

The work of Gamson and Modigliani (1989) and Bogard (1989) provide examples of the application of these concerns to the study of environmental controversies and crises. Gamson and Modigliani (1989) examine the "interpretive packages" developed around the issue of nuclear energy over a forty-year time span (approximately 1945-1985). Such packages provide different sets of images and understandings of nuclear energy. They found that the range of interpretive packages disseminated through the media has increased over time, and the kinds of interpretation they offered changed drastically,

shifting from emphasis on progress in the early years of coverage to more critical evaluations (such as the need for public accountability of the nuclear industry or the high cost of nuclear power relative to some other forms of energy) in more recent times.

Bogard (1989) analyzed the definitional activity that followed in the wake of the disaster at Bhopal. This disaster occurred in December, 1984 when a cloud of toxic gas leaked from a storage tank at a Union Carbide plant in India and resulted in the deaths of several thousand people and the injury of possibly hundreds of thousands more. Bogard shows how in the aftermath of this disaster Union Carbide, the government, and the popular media constructed understandings of the disaster that deemphasized the risks posed by the use of hazardous technologies. An example of such a strategy is that of limiting causal chains, or tracing the cause of the disaster to the actual events at the plant that resulted in the gas leak (attributed by Union Carbide to either human error or purposeful sabotage) rather than locating the cause in broader institutional arrangements, such as the extensive cost-cutting measures that had been undertaken at the plant by the company, or the broader human ecological context of toxic chemicals. Constructions such as these are advanced to encourage people to view Bhopal as an aberration not likely to be repeated in other locales where hazardous technologies are located.

These two works illustrate that social constructivism may be used to analyze environmental controversies and crises in ways that are innovative and insightful. In conducting this research project I found the constructivist perspective useful in providing a rich descriptive understanding of the case and as a general orienting framework. One component of such a framework is viewing social reality as constructed through purposeful human activity (Berger and Luckmann, 1969; Molotch and Lester, 1974). Conditions such as "drunk driving", for example, are not automatically ascertained as "social problems"; rather, such labelling only occurs following moral entrepreneurs' purposeful promotion of conditions as social problems (Ross, 1989).

A second valuable component of the constructivist framework is its encouragement for researchers to approach these kinds of controversies without making judgments about the validity of various claimsmakers' claims or taking the side of any particular set of claimsmakers (Gusfield, 1984). Using a constructivist orientation I analyzed this controversy without taking a position on whether the claims of the pesticide critics or those of the pesticide defenders were the correct ones. My goal was not to defend or castigate either side of the controversy but rather understand how the controversy was shaped by claimsmaking activities. Such an approach encouraged exploration of the complexities and nuances of state action in this controversy, a point I return

to in Chapter Six.

Despite these advantages I also found social constructivism to be inadequate in and of itself to provide a thorough theoretical accounting of this case. To meet this goal I turned to other literatures (discussed below). The value of utilizing other theoretical perspectives in conjunction with that of social constructivism goes right to the heart of a debate within the constructivist camp regarding the kinds of analysis considered appropriate under the constructivist label. Because this debate has occupied a considerable amount of attention (Woolgar and Pawluch, 1985a, 1985b; Hazelrigg, 1985, 1988; Pfohl, 1985; Schneider, 1985; Best, 1989; Troyer, 1992; Rafter, 1992; Holstein and Miller, 1993) I will briefly overview it before concluding this section.

I follow Best (1989) in referring to the two positions in this debate as those of strict and contextual constructivism. The strict constructivists argue that researchers should limit their focus to the claimsmaking process per se, that is, the examination of such questions as how claimsmakers' interpretations of conditions shape their claimsmaking activities. Strict constructivists are particularly critical of analyses which contrast the purportedly inaccurate claims about some empirical condition made by claimsmakers with the purportedly accurate knowledge about the condition possessed by the researcher (Woolgar and Pawluch, 1985; Troyer, 1992).

Contextual constructivists, in contrast, take the position that constructivists should be able to extend their focus beyond that of claimsmakers' activities to include contextual factors that may shed light on the dynamics and outcomes of particular claimsmaking episodes (i.e.,social problems controversies) (Best, 1989; Aronoff and Gunter, 1992). Greenberg (1988) provides a useful contrast of the differences between these two approaches. For example, in accounting for the origins of concerns about particular purportedly problematic conditions, strict constructivists are likely to point to the role played by "moral entrepreneurs" (e.g., Jerry Falwell) or "social problems entrepreneurs" (e.g., Ralph Nader). While these concepts are analytically useful, stopping the analysis at this point leaves many unanswered questions, such as:

> Why do entrepreneurs choose one cause instead of another? Why do they appear at particular moments in history? ... [Why are] some people ... more likely to become moral entrepreneurs than others [?] (Greenberg, 1988:6)

Questions such as these draw our attention to the social context within which claimsmaking occurs. Contextualists' willingness to extend their analysis beyond the claimsmaking process per se makes this position particularly amenable to utilization in conjunction with other theoretical perspectives, and is the constructivist position employed in this dissertation. Examples of contextual factors employed in this dissertation include institutional arrangements of government agencies and the entrenched power base of the

pesticide subgovernment system (Bosso, 1987). The institutionalist perspective on the state and conflict theory helps us make analytical sense of these contextual factors and the role they played in the present controversy.

CONFLICT THEORY

Conflict theory views the inequitable distribution of valued resources such as wealth, prestige, and power, and the conflict stemming from that inequitable distribution, as the most important factors influencing the organization of human societies and the behavior of individuals within those societies (Turner, 1974; Collins, 1975; Buttel, 1976; Flacks and Turkel, 1978; Eitzen and Baca Zinn, 1991). When applied to the study of social problems, the conflict perspective alerts us to the possibility that claimsmakers may enter into social problems' controversies with divergent, perhaps widely divergent, levels of the resources (e.g., legitimacy, power, wealth) needed to pursue widespread acceptance of their definition of a purportedly problematic condition, and with widely divergent interests in the typification outcome.

A resource of particular concern to the conflict theorists is control over those channels of claims dissemination and decision-making to which claimsmakers seek access. Conflict theorists maintain that in modern industrial, capitalistic societies the group exercising the most extensive control over such dissemination channels as popular media and such decision-making arenas as the state are

managers and owners (large stockholders) of major corporations, that is, the corporate or business elite. The basis of this group's ability to exercise such control is their ownership of, or managerial authority over, the vast bulk of the nation's productive capacity (Kolko, 1962; Baran and Sweezy, 1966; Marger, 1987).

Corporate elites are seen to exercise influence over popular media sources through ownership of those sources and as major contributors of the advertising dollars on which those media enterprises depend for much of their revenue (Parenti, 1980, 1986; Bagdikian, 1990). According to the conflict theorists, corporate elites are able to use this power base to ensure that claims about and solutions to social problems contrary to these elites' interests are not disseminated through the popular media. Like the constructivists, conflict theorists are also interested in the ways in which social problems are typified. Conflict theorists' interest in this issue, however, largely revolves around the ways in which different typifications might impact the systemic processes of accumulation, legitimation, regulation, and adaptation. For this reason, conflict theorists make a fundamental distinction between system-blaming and person-blaming typifications (Eitzen and Baca Zinn, 1991).

System-blaming explanations locate the causes of social problems in institutional arrangements, particularly in the

capitalist economic system, the extreme inequalities of wealth that stem from that system, and the imperatives that system creates for businesses to generate a profit regardless of the social costs their activities may impose (e.g., pollution, hazardous working conditions, and unsafe consumer products). Conflict theorists themselves take this position on social problems, viewing such problems to be deeply embedded in existing structural arrangements and therefore only solvable through drastic alterations of those arrangements.

Such system-blaming explanations are contrary to the interests of corporate elites, who benefit from existing structural arrangements and have no desire to see those arrangements questioned or altered. According to the conflict perspective, then, we would expect popular media sources to disseminate few claims of this sort and instead to denigrate groups and individuals who promote such typifications (Gitlin, 1980). Bogard's (1989) work on Bhopal, discussed in the previous section, provides an example of how corporate, state, and media claimsmaking tends to shy away from structural explanations of technological hazards.

Conflict theory would also lead us to expect that corporate elites will promote typifications that offer counter interpretations to these system-blaming typifications. One such counter strategy would be to deny the purported problematic condition even exists, or that it is as serious as those concerned about it claim. One issue on which we see

these kinds of denial claims raised in the contemporary environmental arena is with regard to whether or not the greenhouse effect really exists, and even if some global warming does occur whether or not the impacts of that will be very severe (Ungar, 1992).

If it is granted that a problematic condition does exist and is of a fairly serious nature, then corporate elites are likely to promote typifications of that problem that blame the individuals whose behavior directly constitutes or creates the problem (Eitzen and Baca Zinn, 1991). Thus, crime exists as a social problem because there are individuals who choose to engage in criminal activity. Attributing environmental despoliation to littering is another example of a person-blaming typification (Schnaiberg, 1973).

Another variant of person-focused typifications is to admit that a problem does exist but that the responsibility for addressing that problem should fall on the shoulders of impacted individuals and not on society as a whole. To use Mills' (1959) terminology, the first of these approaches constitutes viewing onerous conditions as "individual troubles", the second as "social problems". Reich (1991) documents how health problems stemming from ingestion of PCB-contaminated rice oil in Japan in the late 1960s was viewed first as the "private troubles" of impacted families, with those families struggling in isolation with the financial costs and social stigma engendered by that contamination.

After the cause of the strange health symptoms was finally identified, and the extent of individuals impacted by the contamination recognized, the contamination became redefined as a social problem, with the accompanying belief that the costs of addressing that contamination should fall on the shoulders of the responsible company and Japanese government, not on the shoulders of impacted individuals.

Utilizing these various bodies of work, I began my case study research with the following hypothesis derived from the conflict perspective:

> Hypothesis 1: The New York Times will have more extensive coverage of the chemical industry's claims regarding the risks posed by pesticide use in the aftermath of Rachel Carson's Silent Spring (mid-1962 through 1965) than of the claims of Rachel Carson and the Audubon Society regarding the risks of pesticide use.

As this hypothesis indicates, I expected to find industry claims dominating in such media sources as The New York Times following the publication of Carson's Silent Spring. I wanted to combine this hypothesis with my constructivist analysis to see if I could discern any pattern as to what kinds of claims promoted by industry were being disseminated through popular media sources. To obtain information on the kinds of claims the chemical industry was promoting as a response to Rachel Carson's Silent Spring I conducted an ethnographic content analysis (Altheide, 1987) of the 75 pesticide-related articles published in the Oil, Paint and Drug Reporter and the 44 pesticide-related articles published in Farm Chemicals over the time period mid-1962 through 1965.

Not surprisingly, the types of claims advanced by industry conformed to the general types of typifications we would expect from corporations and the business community. Problems associated with pesticide use were minimized (see Table 1 for examples of this and following claims). Furthermore, much of the blame for what past mistakes had occurred was assigned to "improper use" by pesticide applicators, exemplifying a classic "person-blamed" typification of a social problem. Carson herself was denigrated. While her literary skills and even the value of her previous books acknowledged, industry spokespeople questioned her scientific competence to make the kinds of assessments of pesticides and their potential health and environmental impacts that she made in Silent Spring. Finally, industry claimsmakers argued that the real issue that people should be concerned about was the problems (such as inadequate food supplies) that would result from not using pesticides.

While the claims raised by industry thus conformed to the expectations of the conflict perspective, coverage of these claims in one media source, New York Times, did not. Analysis of New York Times' coverage of pesticides over the time period mid-1962 through 1965 revealed more extensive and favorable coverage of the claims and concerns raised by Carson and other pesticide critics than the claims raised by industry and other pesticide supporters. An analysis of claimsmakers appearing

Table 1. Claims Categories Advanced by the Chemical Industry as a Response to Rachel Carson's **Silent Spring**, With Exemplary Quotations

Claims Category	Exemplary Quotations
Rachel Carson as the Problem	Rachel Carson has a new book ready for release called The Silent Spring which will contain more slander about pesticides. Even though NAC [National Agricultural Chemicals] people have given her the **facts**, she's ignored them. (Berg, 1962: 52; emphasis in original)
The Problem as Limited	Here, says Dr. Ferguson [NACA Board chairman and president of Geigy Agricultural Chemicals] is how Miss Carson's book distorts the role of pesticides in the nation's life...By citing isolated incidents of accident or misuse as though these were everyday occurrences. (Oil, Drug, and Paint Reporter, 1962a:5)
Improper Use as the Problem	While there have been some cases of nausea and dizziness [from pesticide exposure] reported, these have all been connected with the people manufacturing the pesticides, or with applicators applying the pesticides, who were not using the recommended safeguards (Oil, Paint and Drug Reporter, 1962b:7).
Non-Use of Pesticides as the Problem	Dr. C. Glen King, head of the Nutrition Foundation, argues that the U.S. could not maintain an adequate food supply for its population without the use of agricultural chemicals. (Oil, Paint and Drug Reporter, 1962c:53).

in New York Times' headlines of the 165 pesticide-related articles published between mid-1962 and 1965 showed that industry appeared as a claimsmaker in five headlines, while Rachel Carson and/or the Audubon Society appeared as a claimsmaker in 21 headlines. Other pesticide critics appeared in 68 headlines over this time period, while other pesticide defenders appeared in 17 headlines. Overall, pesticide critics appeared in four times as many headlines as pesticide defenders. Table 7 (Chapter Five) reports the extent to which various claimsmakers appear in the text of the 142 pesticide-related articles published in the New York Times between the period mid-1962 through 1964. The chemical industry appeared as a claimsmaker in the text of only 10 percent of all articles published over this time period. To provide a point of contrast, Rachel Carson appeared in 34.5 percent of these articles.

Indeed, coverage of industry claims in this publication was so limited that pursuit of what I had envisioned as the second leg of this process, examination of the dissemination of particular industry claims through the media, was abandoned. This early media analysis not only pointed to the futility of undertaking this analysis, however; it also suggested a new line of potential inquiry. Specifically, while this analysis had shown New York Times coverage of the claims and actions of corporations and other pesticide critics to be limited it also revealed extensive coverage of another

powerful set of elites: government officials. Indeed, federal claimsmakers were portrayed in more New York Times' headlines over the period mid-1962 through 1965 than any other set of claimsmakers, appearing in 26 percent of all headlines published during this time. In contrast, the next most frequently occurring category of claimsmaker, Rachel Carson and/or the Audubon Society, were portrayed in 13 percent of headlines.

In the following section I discuss literature pertaining to media-state relations. Because my subsequent case study analysis takes as its point of focus the role of the state in environmental controversies, I provide a brief overview in the remainder of this section on conflict perspectives on the state. Later in the chapter I further elaborate my use of this literature in efforts to understand the ways in which government agencies and officials were impacting the nature, dynamics, and outcomes of this particular environmental controversy.

As is the case with popular media, corporate elites are seen by conflict theorists to have far more extensive access to, and influence over, the state than other claimsmakers. This influence is exercised through such means as linkages between corporate and state elites stemming from common social backgrounds (Miliband, 1969), actual participation of corporate elites in government (Mills, 1956; Kolko, 1962), political campaign contributions, lobbying, and participation

in the policy process via funding university and foundation research that helps to guide agenda-setting and policy responses (Marger, 1987; Kerbo, 1993). Some theorists have argued that the state enacts policies beneficial to the interests of corporations and the corporate elite even when that elite does not actively campaign for those policies. This occurs because of government officials' need to maintain their own legitimacy in the eyes of the populace and the potential threat a poor economy poses to that legitimacy (Poulantzas, 1973; Block, 1977).

According to Schnaiberg (1980; see also Schnaiberg and Gould, 1994), it is in the interests of both corporate and state elites to continue and expand the production of consumer and capital goods, a process they label "the production treadmill". The state receives two primary benefits from production expansion:

> (1) an increased flow of revenues from the private sector (capital and labor taxes); and (2) an increased ability to satisfy the demands of both constituencies [capital and labor] for economic and social programs. (Schnaiberg, 1980:211)

At the same time, operation of this treadmill generates significant environmental problems. These problems stem from the treadmill's extensive consumption of scarce natural resources (depletion) and generation of waste by-products (pollution). Because operation of the production treadmill is seen as in the interest of both corporate and state elites, and because policies advocated to address environmental

problems often threaten some component of the treadmill, the conflict perspective would lead us to predict that government agencies and officials would respond to threatened or actual environmental crises and controversies in ways designed to avoid, contain, and/or defuse conflict. I will return to this issue later in the chapter.

I found conflict theory, like social constructivism, useful in understanding some but hardly all of the events and facets of this controversy. As was the case with social constructivism, one of the major advantages offered by conflict theory was a general orientation that sensitized me to the existence of differing interests and resources of claimsmakers and how these might impact the dynamics, nature, and outcomes of this controversy. The dynamics and outcomes of the present controversy, for example, were extensively influenced by the existence of a powerful subgovernment system that both promoted extensive pesticide use and defended USDA's preponderant authority over pesticide registration and regulation (Bosso, 1987).[2] I provide more detailed discussion

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[2] As a model of one of the ways in which interest groups may exercise influence over government policy, subgovernment systems are hardly the exclusive property of the conflict theorists (Salisbury et al., 1992). Indeed, if we examine the question of interest group access to government at the macro level, it could well be argued that the existence of numerous subgovernment systems formed around a variety of different policy arenas is more supportive of pluralist than conflict perspectives of the state. In particular, the existence of numerous subgovernment systems supports the pluralists' contention that government affords numerous points of access to a diverse range of interests, and also that industry efforts are fragmented, with particular industries seeking

of this subgovernment system in Chapter Four.

Not surprisingly, given the existence of this powerful subgovernment system, pesticide critics met with little success during the 1960s in implementing substantial changes in pesticide policy (Bosso, 1987). In a sense, then, there is a bivalent response to the question of the extent to which industry's interests were damaged by this controversy. Publicly, industry did not fare particularly well. Pesticide critics had much greater success than pesticide defenders in disseminating their definition of "the pesticide problem" through the New York Times in the years immediately following the publication of Silent Spring. On the other hand, during the 1960s industry and other pesticide supporters were much more successful than pesticide critics on the solution/policy end.

NEWS MEDIA

As I explained in the previous chapter, grounded theory is a circular research technique characterized by continual movement between data gathering, data analysis, and conceptualization and theorizing, with part of this latter activity including interacting with existing literature (Althiede, 1987; Corbin and Strauss, 1992). Conforming to the

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access only within the limited policy arenas that directly impact them, rather than coordinated and unified, as is the contention of conflict analysts (cf. Marger, 1987). Nonetheless, within particular policy arenas subgovernment systems can present powerful barriers to "outsiders" seeking to influence policy within that arena (Bosso, 1987).

precepts of grounded techniques, I followed the failure of the data analysis to support my one hypothesis with a more extensive excursion into the media literature. This literature search was guided by the finding, reported in the previous section, that federal officials and agencies were the most frequently occurring claimsmakers appearing in the New York Times' coverage of pesticides during the period mid-1962 through 1965.

As I read more extensively in the media literature I quickly encountered arguments that would lead one to expect exactly what I found: on average, government agencies and officials are going to have greater success than any other set of claimsmakers in getting their own claims and actions disseminated through the media. Tuchman's (1978, 1988) observational study of reporters at several urban newspapers represents one of the classic works in this area. Theoretically, Tuchman's work represents a blending of constructivist, organizational, and conflict analyses. As the name of her 1978 book, Making News: A Study in the Construction of Reality indicates, Tuchman regards news as a socially created product.

Organizationally, linkages between the government and news media are encouraged by the ongoing imperative of news media enterprises "to make news" (Tuchman, 1978). News organizations must, on some regularized time schedule (once or several times a day, once a week, etc.), produce some product

(e.g., a newspaper, newsbroadcast, or weekly news magazine) consisting of the latest news items, and there must be enough of these "news items" to fill some minimal page space or prearranged air time. Furthermore, such news must typically be assembled within a very limited time frame.

Taken together, these factors encourage news reporters to develop "beats", that is, routine checking of locales where newsworthy events are likely to happen on at least a semi-regular basis. Such locales include the White House, state and federal legislatures, city halls, and police and fire departments. Officials often make things even easier on reporters by assembling statements or statistics that can be readily incorporated into news stories. Tuchman (1978, 1988) refers to this arrangement as the "news net". This net is beneficial to both reporters, because it helps them meet their daily or weekly quota of "news stories", and to government officials, because it helps to ensure that the public hears the news they want them to hear.

Gans' (1979) work also consists of observational studies of reporters at two of the major broadcast networks (CBS and NBC) and at the two major newsweeklies (Newsweek and Time). Like Tuchman, he found the relationship between government officials and reporters to be a largely symbiotic one, and that the underlying motivation for that relationship from the perspective of the reporters was the organizational imperative to produce news. Indeed, Gans identified another important

way in which use of government officials as news sources aided reporters' need to generate news items under severe time and resource constraints. In general, reporters tend to regard government officials as individuals possessed of a legitimate right to address the pressing issues of the day. Because they are regarded as legitimate spokespeople, in most circumstances reporters do not feel a need to go to extensive efforts to verify their claims, facts, and figures. Reporters are more likely to feel a need to check out the stories of sources not awarded this level of legitimacy, actions which of course consume scarce time and resources.

Similar themes and arguments are encountered in the work of Molotch and Lester (1974, 1975). These authors also take a constructivist approach to news, viewing it as constituted through the purposeful behavior of news promoters and news assemblers. Whereas Tuchman (1978) and Gans (1979) placed greater emphasis on examining news assemblers, Molotch and Lester (1974, 1975) place greater emphasis on news promoters. According to these authors, most news consist of "routine events", or news items where:

> the people who undertake the happening...are identical with those who promote them into events. The prototypical routine event is the press conference statement. (Molotch and Lester, 1974:106)

Like Tuchman (1978) and Gans (1979), Molotch and Lester regard government officials as having "habitual access" to news media. They provide empirical documentation of such habitual access in their study of newspaper coverage of the

1969 Santa Barbara oil spill (1975). After analyzing the coverage of this oil spill in 20 different newspapers (18 regional/metropolitan papers, one national paper, and one foreign paper), they find the news promoter whose promotional efforts were most likely to result in news coverage was the President of the United States. Of the thirteen most successful news promoters, eight were associated with the federal government. In addition to President Nixon these included Walter Hickel of the Department of the Interior, officials of federal conservation agencies, the U.S. Attorney General, members of the U.S. Congress (House and/or Senate), directors of federal executive-sponsored studies, Congressional Republicans, and Congressional Democrats. Three more of the top thirteen promoters were connected with state governments.

Herman and Chomsky (1988) also regard popular news media as reflecting the interests and perspectives of business and government elites. Indeed, they regard news media as essentially a channel of propaganda dissemination. According to these authors, various filters are embedded in the news production process that serve to filter out news contrary to elite interests. These filters largely consist of various elements I have previously discussed, including corporate ownership of media enterprises, the importance of advertising dollars, and the organizational imperative to produce news. The first two of these filters are seen to provide

corporations considerable influence over news and other popular media, while the latter encourages the kinds of symbiotic relations with government officials described by Tuchman (1978) and Gans (1979).

Herman and Chomsky (1988) provide empirical support of their argument by comparing media coverage of similar kinds of events occurring in countries that are either allies, or enemies, of the U.S. government. For example, U.S. news sources gave extensive coverage of the murder by the Polish police of the Catholic priest Jerzy Popieluszko in October, 1984, a time when Poland was still within the Soviet bloc. They contrast this with minimal coverage given to the hundreds of religious personnel murdered in such Latin American client states as El Salvador during the 1960s, 1970s, and 1980s.

These works, combined with my own analysis of New York Times' coverage showing the prevalence of governmental claimsmakers and the paucity of industry claimsmakers, led me to conclude that understanding of this particular controversy would require understanding of the claims and actions of governmental claimsmakers. The following three sections discuss literatures that contributed to this endeavor.

AGENDA SETTING

In this section I discuss works that examine the process whereby issues are added to, and taken off, the political agenda. The political agenda consists of:

> the list of subjects or problems to which governmental officials, and people outside of government closely

> associated with those officials, are paying some serious attention at any given time. (Kingdon, 1984:3)

The political agenda is a broad conceptual category that subsumes a number of more specialized agendas (Hoberg, 1992). A distinction can be made, for example, between the public agenda, or the list of issues and concerns being attended to by popular media and the public, and the government agenda, or the list of issues and concerns being attended to by government agencies, officials, legislative bodies, courts, etc. Particular agencies, Congressional committees, Congresspeople, and the President and the Administration also have their own agendas. It is also useful to recognize that issues may have higher or lower agenda status, that is, they may be receiving limited or extensive attention from government officials. Issues with high agenda status are on the decision agenda, "the list of subjects within the governmental agenda that are set up for an active decision" (Kingdon, 1984:4).

There is considerable overlap between the research interests of the agenda setting literature and constructivist approaches to social problems. Indeed, when claimsmakers advocate for defining a particular empirical condition as a social problem they are concomitantly advocating that that condition be placed on the public agenda. Furthermore, such advocacy is frequently undertaken to gain government attention to and/or redress of the condition, in other words, to get the problem placed on the government agenda. It is also the case

researchers working on agenda setting generally utilize constructivist approaches to problem definition and typification, as we can see in the following quotations:

> Any given policy usually could be associated with many contending images, so logically these may change over time, and in fact the dominant public understandings of many public issues have often changed in the past. (Baumgartner and Jones, 1993:8)

> There is a difference between a condition and a problem... conditions become defined as problems when we come to believe that we should do something about them. (Kingdon, 1984:115)

Recognition of the possibility that it might be fruitful to use agenda setting literature to examine this particular controversy occurred through a totally serendipitous encounter: I was giving a public administrator a ride from the airport one day, during which I gave her a brief overview of my dissertation research. She suggested I might find John Kingdon's (1984) book useful. I decided to give it a try, and found that her suggestion was an accurate one. Indeed, a frequent reaction as I read through Kingdon's work was, "Good grief! this is just what I found in my own research." I subsequently read (or in some cases reread) other works on agenda setting, particularly those by McCombs and Shaw (1972), Downs (1972), Cobb and Elder (1983), and Baumgartner and Jones (1993). Of these works, I found Kingdon's most useful for analyzing this particular controversy.

In the remainder of this section I discuss those elements of Kingdon's work that I found particularly applicable to the post-World War II controversy over the use of synthetic,

organic pesticides. In the following two sections I discuss the process whereby I incorporated these elements, together with analyses and insights presented in previous sections, into a coherent theoretical accounting of this particular controversy. The five elements from Kingdon's work I discuss in the remainder of this section are: problem identification, softening up, policy windows and the issue-attention cycle, government officials as claimsmakers, and alternative specification.

Problem Identification

The social constructivist perspective seeks to understand how particular empirical conditions (or alleged conditions) come to be defined as social problems (Spector and Kitsuse, 1977; Schneider, 1985; Best, 1989; Holstein and Miller, 1993). While there are numerous locales from which such claimsmaking may originate, Kingdon identifies one route that accurately reflects one of the important origins of concerns about pesticides in this case, that of routinized detection mechanisms. Kingdon (1984) has identified two such routinized detection processes that are particularly relevant to this case.

The first of these is various indicators periodically gathered by government or other organizations that may serve as "signals" that a problem exists. While Kingdon only explicitly mentions economic (e.g., unemployment rates) and social (e.g., crime rates, divorce rates) indicators,

certainly indicators associated or potentially associated with environmental/technological impacts (e.g., monitoring of toxins in groundwater and of morbidity and mortality rates in an area) also fall under this general heading. Thus, for example, morbidity indicators displaying an above-average level of a certain type of cancer in areas where a particular toxic substance is manufactured and/or disposed may lead to concerns about the substance, and perhaps eventually to a full-fledged technological controversy. In the present controversy, research and regulatory activity by the USDA and the FDA in the early part of this century meant that such institutionalized monitoring mechanisms were well established when the new synthetic organics such as DDT came on board during World War II (Perkins, 1978; Dunlap, 1981).

A second, and closely related, routinized detection process that may reveal (what some claimsmakers will interpret as) potential problems with a particular technology is a government agency's monitoring of its own or another agency's programs, in this case, programs that make use of the technology in question. Such monitoring may reveal unintended negative consequences stemming from the agency's use of a particular technology, consequences that may themselves become (or threaten to become) the focus of social problems' claimsmaking. In the present controversy, Department of Interior personnel expressed mounting concern over widespread use of the new synthetic organics following their agency's

monitoring of fish and wildlife losses in the aftermath of two massive USDA treatment campaigns (Dunlap, 1981).

Focusing events provide another set of empirical happenings that also often facilitate labelling of a particular condition as problematic. Among the most common of these focusing events are such crises and disasters as the crash of a commercial jet liner or an earthquake impacting a large urban area. These crises and disasters are typically the subject both of media coverage and government investigations into the causes of and/or potential responses to the disaster, activities that may reveal some broader underlying problem (e.g., inadequate airplane maintenance, inadequate enforcement of building codes) which needs to be addressed. Stallings' (1990) research on the collapse of a highway bridge in upstate New York that resulted in the deaths of ten people warns us that the movement from an isolated disaster to successful social problems claimsmaking is not automatic. While in the aftermath of this disaster several New York Times' reporters gathered information that situated this bridge collapse within a more extensive national problem of poorly maintained highway bridges, no ensuing clamor to address the problem of unsafe bridges emerged.

Another type of focusing event that has particular relevance for this study is popular media publications (e.g., books, magazine articles, films) that brings the condition to widespread public attention. Upton Sinclair's 1906 book The

Jungle, an expose on the unsanitary conditions in the Chicago butcher shops of the time, played an important role in facilitating the passage of the 1906 Pure Food and Drug Act (Whorton, 1974). In the present controversy the 1962 publication of Rachel Carson's Silent Spring also served as a "focusing event" that brought heightened levels of media, public, and government scrutiny to the pesticide problem.

Softening Up

I initially approached this project from the perspective of environmental movement literature, and was interested in Carson's work because of the central role it was seen as playing in galvanizing the contemporary environmental movement (Graham, 1970; Lutts, 1985). At that time I knew nothing of pesticides beyond the fact that they were a central focus of Carson's Silent Spring. I also knew that Silent Spring was typically portrayed as a "watershed" event in American environmental history, leading me to hold what subsequently proved to be an erroneous perception that "first there was nothing, and then there was Carson".

I initially became aware that concerns about pesticides in general (see particularly Whorton, 1974), and synthetic organics in particular (see Bosso, 1987), were raised long before the publication of Silent Spring very early in the research project. My first foray into the pesticide literature occurred in Richard Child Hill's Historical and Documentary Methods course, where I identified a range of

pesticide-related literature published during the 1940s and 1950s. While most of this coverage was positive (or at least appeared so from article and books titles), certainly not all of it was. I found this to be intellectually intriguing, but also at the time conceptually inexplicable, so when I started in on my dissertation research I set this particular "finding" aside and initially focused in on the post-Silent Spring era.

Kingdon's (1984) concept of institutionalized monitoring mechanisms, discussed in the previous section, helped me to locate theoretically the role played by government agencies in the early identification of potential health and environmental problems with the new synthetics. His concept of "softening up" suggested the potential impact this pre-Silent Spring "problem identification" had on controversy development. While widespread concern about and attention to a particular condition sometimes seems to burst upon the scene almost overnight, Kingdon maintains that successful placement of a social problem on the political agenda is likely to happen only after years of effort on the part of at least a few dedicated claimsmakers. Given that at any point in time a multitude of conditions exist that could be potentially defined as social problems, that the government has limited ability to address these multitude of problems (Cobb and Elder, 1983), and that various solutions advanced to ameliorate those conditions will impose costs on at least some segments of society, it is probably not surprising that

initial claimsmaking efforts do not generally meet with success. These early claimsmaking efforts are important, however, because they help pave the way for success down the road, if in fact such success does occur (and there is no guarantee that it will). According to Kingdon, new items tend to be added to the political agenda, or old items moved to higher agenda status, only after a (sometimes considerable) period of "softening up".

This softening up period is characterized by a few dedicated claimsmakers presenting evidence to support their claim that a particular condition is problematic and in need of government amelioration. While a single crisis or disaster event (such as a bridge collapse, a crash of a commercial jetliner, an accident at a nuclear power plant, or an urban riot), or warning of problems by a few individuals (particularly when most experts in an area do not agree with this problem designation) may be treated as aberrations, such dismissals become more difficult when repeated crises occur, or when there is mounting evidence from respected experts that future crises are likely.

This "softening up" process is important not only for success at getting a particular condition labeled as a social problem but also for eventual acceptance of proffered solutions. As Kingdon puts it:

> Softening up seems to be necessary before a proposal is taken seriously. Many good proposals have fallen on deaf ears because they arrived before the general public, the specialized publics, or the policy community were ready

to listen. (1984:137)

Policy Windows and the Issue-Attention Cycle

While it may take years or decades for an issue to be softened up sufficiently to receive prominent placement on the political agenda, once it receives such prominent placement the chances are quite good it will not retain that position for long. Kingdon (1984) refers to those brief periods of time during which a problem has achieved prominent agenda status and solutions to the problem are being advanced as "policy windows". Likewise, media and public attention to particular problems are also generally considered to be brief in duration, a phenomenon known as the "issue-attention cycle" (Downs, 1972; Cobb and Elder, 1983).

That policy windows tend to have such short durations is due to the costs associated with placing and keeping an item prominent on the government agenda. If solutions to the problem (e.g., new legislation or regulations) are not quickly realized, proponents of change may conclude pursuit of those solutions is not likely to result in success at the present time and therefore stop investing further resources in those efforts. Of course, if solutions are quickly realized it is likely that the problem will appear to be solved, or at least adequately addressed, by all but the most ardent and committed of claimsmakers (see, for example, Mauss, 1975:65), which will also result in the removal of the problem from prominent agenda status.

A number of reasons have been advanced for the typically short period of time it takes the popular media and public to move through the issue-attention cycle. According to Gans (1979), journalists and reporters at least perceive that audiences quickly grow bored with stories (in this case, the "story" would consist of the environmental controversy). As a result, unless journalists, reporters, and/or editors define the story to be one of major national significance (such as a war), or unless there are ongoing developments that allow new angles to be taken on the story, they are likely to drop coverage of the story once they perceive it as having grown "stale". The need of news organizations to generate "new" news (Tuchman, 1978; Gans, 1979) also encourages this response. After all, why would anyone keep buying newspapers if they simply reported the exact same news week after week?

Downs (1972) identifies another reason for the issue-attention cycle. According to this work, initial public recognition of a social problem is typically accompanied with enthusiastic assessments of the government and nation's ability to solve the problem. Such enthusiastic assessments stem, or so Downs contends, from the failure of media and the public to recognize that the causes of social problems are deeply rooted in existing institutional arrangements. This failure, in turn, leads media and the public to grossly underestimate the costs (including government spending, potential job loss, and behavior modification) of addressing

those problems. As policies enacted during the period of heightened media and public attention and concern start to be implemented, however, the "true" cost of addressing problems becomes increasingly apparent, and accordingly public enthusiasm wanes.

Jasper (1988) presents yet another twist on the issue-attention cycle. In his model, government action sends a message to the public that the problem is being "taken care of", and thereby reinforces and perhaps even hastens movement through the cycle. I discuss Jasper's model in more detail below. In the following two sections I use the concepts of institutionalized monitoring mechanisms, softening up, and policy windows to develop an argument on how the kinds of activities government agencies and officials are taking with regard to a particular condition prior to widespread public concern about and controversy over the condition influence subsequent development of the controversy.

Government Officials as Claimsmakers

A common model of government involvement in agenda-setting and environmental controversies is one of governmental response to concerns raised by other individuals and groups in the society. Such a model of issue/conflict expansion (cf., Cobb and Elder, 1983; Reich, 1991; Baumgartner and Jones, 1993) begins with (1) concern and agitation among members of some specialized public or publics (e.g., consumers harmed by unsafe products, university scientists, members of

environmental organizations), which may lead to (2) dissemination of at least some of these claims and concerns through popular media sources, which may lead to (3) much broader public concern, which may lead to (4) government response. This model of response is compatible with conflict theory, which also postulates that the state will respond to environmental controversies in a recalcitrant and obstructionist manner (cf., Schnaiberg, 1980; Schnaiberg and Gould, 1994).

This model of conflict expansion not only suggests delayed and reluctant response to environmental controversies, but also that public opinion and popular media can exercise considerable influence on government action. While Kingdon (1984) does not deny that the flow of influence is sometimes from media and public to the government, as the conflict-expansion model predicts, he also maintains that generally government officials exercise more influence over the public agenda than vice versa. That the line of influence typically runs from government to media to the public rather than the other way around makes sense when we consider both the symbiotic relation between government and media and the short attention cycle given most issues. I return to this latter point below.

Combining this observation with my earlier discussion of Kingdon's work suggests several potential ways in which government agencies and officials might be involved in, or

respond to, environmental and other social problems controversies. First, the existence of institutionalized monitoring mechanisms means that in at least some cases government agencies may be among the first, if not the first, to label a particular empirical condition as problematic. Given the relatively privileged access of government agencies and officials to news media, this means that rather than being late and recalcitrant responders to controversies government agencies and officials may, in some cases, be one of the initiators of controversy (or at least the concerns that lead to controversy).

Second, as a result of the issue-attention cycle (Downs, 1972), government officials tend to view popular media with some disdain, regarding their coverage of issues to be "sensationalistic" in nature and also likely short-lived, the latter of which provides officials with some leeway to ride out waves of concern on issues they do not want to address. Kingdon (1984) provides one example of this in the health care area. There had been considerable popular media coverage in 1977 of potential health problems stemming from ingestion of the artificial sweetener saccharin, however, in interviews with federal health officials and other actors in the policy health network Kingdon found only 14 percent of respondents mentioned saccharin as an issue either being addressed or needing to be addressed by the government. In this case, then, fairly high placement of an issue on the public agenda

was not accompanied by a corresponding placement on the government agenda.

Third, we would expect government officials and agencies to be most likely to mobilize and respond to an environmental crises or controversy when they have on hand an already prepared and softened up proposal that can address the problem, or at least be presented in that light.[3] There are two previously discussed characteristics of the agenda setting process that indicate the importance of having a prepared and softened up policy on hand when one of these policy windows open. The first of these is that the kind of focusing events (such as crises and disasters) which often open these windows are difficult if not impossible to anticipate. The second is the typically brief duration of these windows. This brevity makes it very difficult for individuals or organizations to formulate, and gain support for, a policy response after a policy window has open.

Alternative Specification

Alternative specification, or the identification of particular policy options to some problem area, typically occurs in tangent with agenda setting. As the preceding discussion indicates, policy window opens when some issue or problem moves to a high status on the government agenda. When this happens, we are likely to find various individuals and

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[3] Kingdon (1984) maintains that government officials and bureaucratic personnel frequently generate desired policies and then search for problems to which they can be attached.

agencies in government pushing their own particular set of solutions to that problem. Out of the negotiations and posturing that accompanies the promotion of pet policies there generally emerges a much smaller subset of options which involved participants recognize as the ones that at least have some potential to receive serious consideration. In the case study I refer to this set of options as the "policy template".

While agenda setting is often (though not necessarily) public in nature, the process of generating a list of policy options is generally carried on out of the public limelight (Kingdon, 1984). Furthermore, the types of actors involved in these two activities tend to differ. Top government officials such as the President and leading members of Congress are most likely to be active in getting an item placed on the political or government agenda (or raising an item to higher agenda status), while Congressional and White House staff, civil servants (career bureaucrats), and interest groups are most likely to be involved in hammering out possible policy responses.

In the present controversy both the U.S. Department of Interior and the Food and Drug Administration had pushed for changes in pesticide policy prior to the publication of Silent Spring. Both of these agencies, therefore, had proposals softened up and ready to go when the publication of Silent Spring pushed pesticides onto a much more prominent place on the government and public agendas. In Chapter Five I

demonstrate how these proposals came to dominate the primary policy template (a special report prepared by the President's Science Advisory Committee) that emerged in the aftermath of Silent Spring.

Section Summary

As the preceding discussion illustrates, Kingdon's (1984) work provided many valuable insights into this controversy. At the same time, Kingdon's work did not supply all the elements I needed to develop a coherent theoretical accounting of this case. More specifically, the concepts discussed above were useful for understanding discreet elements of the case, but they did not always provide the needed insight on how these various elements fit together and influenced each other. In particular, since Kingdon's work focuses primarily on the government agenda, it did not provide much insight into the specific ways in which the government agenda influences the public agenda. Since the major focus of my own primary analysis was on the news media this proved to be a major shortcoming. To address this shortcoming I turned first to Jasper's work on technological controversies, then to work on the institutionalist perspective on the state.

JASPER'S MODEL OF THE POLITICAL LIFE CYCLE OF TECHNOLOGICAL CONTROVERSIES

As was the case with agenda setting, I came across Japser's (1988) work on the political life cycle of technological controversies after I was already well into the

research project. By that time I had gained extensive familiarity with the case study materials, identified a number of conceptually intriguing elements of the case, and was trying to put all of these pieces together into a coherent theoretical framework. I initially thought that Japser's work would provide such a framework, and used his stage model (described below) as the central organizing theme in my case study presentation. For reasons I explain at the end of this section, Jasper's work does not occupy center stage in the analysis of the case study presented in this dissertation. My attempts to apply Jasper's model to this case resulted in important methodological and theoretical developments, however, and for this reason I present here a brief overview of Jasper's work.

Based on his work on controversies over nuclear energy in the U.S., France, and Sweden, Jasper (1988) develops a model of technological controversies that posits five different stages of political activity and conflict generally found over the life cycle of such controversies. The first of these is the **pre-political** stage; it is marked by a general lack of concern about (or perhaps even enthusiasm about and endorsement of) the technology in question. The second stage, **politicalization**, marks the transition into the controversy proper. By this stage at least some individuals and/or organizations in the society (e.g., university scientists, government officials, environmental organizations) have begun

to question the safety of the technology and debates between these critics and the technology's supporters are aired in the popular media. The third, or **political stage**, is marked by a high level of mobilization of the various claimsmakers active in the controversy, and increased levels of public concern about the technology.

The fourth stage, that of **depoliticalization**, is another transitory period. During this period government officials take action to address the concerns raised during the preceding two periods. Such action sends a message of reassurance to the public that the issue is being adequately addressed, and this reassurance, combined with issue exhaustion (discussed below; see Downs, 1972; Cobb and Elder, 1983), serves to diffuse the controversy. This diffusion leads to the final period, that of **resignation**, where the public accepts whatever policies were adopted during the political period.

Jasper develops this five-stage model to explain the public's changing perceptions of, and attitudes toward, nuclear energy. In short, Jasper argues that the dynamics influencing public opinion on nuclear energy (or other -- purportedly -- hazardous technologies) differ across these five stages.

> Political context is the master variable explaining these differences [in public opinion across time]: confidence in experts dominates prepolitical periods; media attention leads to politicalization; basic values are key to attitudes in fully politicized periods; issue attention cycles explain depoliticalization. (Jasper, 1988:357)

The present case study does not follow Jasper's initial goal of utilizing these five stages to illuminate the changing nature of public opinion toward some technology -- in this case, pesticides -- due to the lack of adequate public opinion data on pesticide use from the time period covered in this study (mid-1940s - 1960s). It does, however, allow for an examination of the contextual factors that Jasper associates with these various stages, and it was to this endeavor that I turned my attention.

There were two reasons why I felt application of Jasper's model to the present case might be particularly valuable. First, Jasper's model is an examination of the agenda setting process as it relates to one particular class of problems, those associated with the use of hazardous technologies. I had already found considerable value in using the agenda setting literature, and thought Jasper's work would provide a useful model for organizing and presenting that material. Second, Jasper's model posited an important role for government officials in at least one phase of a technological controversy, that of depoliticalization. Jasper's work thus seemed ready-made to fit with my own consistent research conclusion that I needed to understand the role of government agencies and officials in this controversy.

Applying Jasper's model to this case meant I had to undertake more extensive documentary research than I had done to date. This fits within the precepts of the circular

research process of grounded theory (Altheide, 1987), where data analysis leads to new conceptual understandings of the case, which in turn guides further data gathering. For starters, application of Jasper's model to this case required that I extend my analysis back in time to the first widespread use of synthetic organics during the World War II era. If Jasper's model was accurate, then we should find both a 'pre-political' stage and a period of politicalization occurring between the mid-1940s and the publication of Carson's Silent Spring in 1962.

While I had already acquired a general sense of activities surrounding pesticide development and use in this and earlier time periods from the secondary sources, I now extended my focus to include primary sources from the 1940s and 1950s. To determine if Jasper's prediction about the lack of negative media coverage during the time immediately following introduction of synthetic organic pesticides was correct, I first undertook a careful examination of articles on the pesticide DDT published in the New York Times between 1944 (the year the first article on DDT appeared in that paper) and 1961 (the year prior to the publication of Silent Spring). I chose to initially focus on DDT because it was the best known of the new synthetics. I subsequently included an examination of coverage of pesticide issues published in the three major weekly news magazines (Newsweek, Time, and the U.S. News and World Report) and Reader's Digest from the mid-

1940s through the 1960s, though I only undertook a systematic analysis of material covered in the New York Times because of the more extensive coverage of pesticide issues in that publication.

Application of Jasper's model to the present controversy also required that I extend my analysis of primary sources beyond the year 1965 (the cut-off date proposed in my original research questions and hypothesis). I carried this extension out through the year 1969. A cursory examination of primary and secondary sources suggested that the time period of mid-1964 through 1968 offered at least general conformity to Jasper's fifth stage of technological controversies, that of resignation, where the controversy largely or completely recedes from public view. The year 1969, on the other hand, marked a renewed escalation of the conflict as efforts to ban the pesticide DDT were undertaken in two states -- Michigan and Wisconsin -- as well as at the federal level (Graham, 1970; Dunlap, 1981).

While applying Jasper's five-stage model of the political life cycle of technological controversies to this controversy yielded a more conceptually coherent and satisfying understanding of this case than that yielded by my initial answers to the research questions and hypothesis in the sections on "social constructivism" and "conflict theory", there were still problems with using it as the central organizing theme for the case study analysis. For one thing,

Jasper's five stages had general but not absolute applicability to this controversy. For example, 1944 was the only year when no negative claims about DDT appeared in the New York Times, and even during this year governmental research was already raising concerns about potential chronic health impacts of DDT (Perkins, 1978). Hence, this controversy did not seem to have a truly "pre-political" stage, though it did have a period when enthusiasm about the new synthetics was substantial and largely overwhelmed the negative claims that were made. I also had difficulty separating the political stage from that of depoliticalization of the conflict, as I will discuss further below.

Another problem with using Jasper's model as an organizing framework (minus his innovation of relating these stages to changing levels of public opinion) was that I ended up with a lengthy, cumbersome description of the events going on at these various stages whose contribution to existing literature was not easy to discern. That this particular controversy generally conformed to Jasper's model of conflict expansion and contraction would hardly surprise anyone familiar at all with this case or other social problems controversies. While I had conducted some analysis of this case not contained in existing sources, these contributions were largely lost in my attempt to discuss a very broad range of claims and activities surrounding pesticide politics during this roughly 25-year time period (1944-1969). I decided at

this point what I needed was a more focused argument that would allow me to present a coherent and comprehensible analysis of a somewhat more restricted aspect of the case.

As I have previously indicated, both my analysis of this case and my reading in such literatures as those on news media and agenda setting had led me to conclude an analysis of the claims and actions of government officials and agencies were an important component to an overall understanding of the nature, dynamics, and outcomes of this particular controversy. One consequence of my attempts to identify the demarcating point between the political and depoliticalization stage of this controversy was the conclusion that this concern should become the central organizing focus of my case study analysis. While I felt comfortable designating the publication of Silent Spring as the start of the political phase, government response to Carson's work was quick to follow. This made it difficult to determine just exactly where the "political" stage ended and "depoliticalization" began.

I ended up designating the "depoliticalization stage" as the brief time period in mid-1964 when the two primary government responses to Silent Spring -- the 1964 FIFRA amendments and the Federal Committee on Pest Control -- were undertaken. In my attempts to demarcate this stage, however, I became increasingly convinced that I could not automatically assume that the explicit goal, or the unintended effect, of government action was depoliticalization. That

depoliticalization would in fact be the overriding goal of government officials was suggested not only by Jasper's (1988) model but also by the conflict theorists (Schnaiberg, 1980; Reich, 1991; Schnaiberg and Gould, 1994) discussed previously. With this insight I turned to the institutionalist perspective on the state, to develop the final piece of the theoretical puzzle -- the way in which way in which the claims and actions of government officials were influencing media coverage of this controversy.

INSTITUTIONALIST PERSPECTIVES ON THE STATE

The final body of literature I incorporated into my analysis of the post-World War II controversy over synthetic organic pesticides is that of institutionalist perspectives on the state, also known as the "state-logic" or "state centered" approach (Skocpol, 1979, 1985; Buttel, 1985; Campbell, 1985; Hoberg, 1992; Carruthers, 1994). A recent development in state analyses, the institutionalist perspective emerged as a challenge to both the pluralist and neo-marxist theories of government that had hitherto dominated political analysis. Neither the pluralist nor the neo-marxist theories of the state viewed the various components of the state apparatus (e.g., agencies, courts, etc.) as agents who brought to the political process their own organizational, career, and personal interests. In contrast to this view, the pluralists treated the state as a neutral arena within which various interest groups contended over government policy (with no one

getting their way all the time) (Marger, 1987), while the neo-marxists viewed the state as protecting and furthering the interests of the corporate elite (Skocpol, 1985) or of capital in the abstract (Buttel, 1985).

The institutionalists, in contrast, seek to understand the way in which the component parts of the state operates as players in the political process. As Hoberg (1992:3) put it, the institutionalist perspective "emphasizes the power of government officials to embody their own preferences in public policy." Included among these interests are the protection of bureaucratic turf and expansion of resources (Downs, 1966; Hoberg, 1992), or what I will refer to in this dissertation as organizational interests. Bureaucrats, agency officials, and other governmental personnel also undertake action that will promote their own careers, or what I refer to as "career interests". Finally, government officials and bureaucrats may also promote policies that further their own personal or political philosophies about what kinds of social arrangements are good, just and desirable. I refer to these as "personal interests".

The state may also exert an influence over policy outcomes via the nature of the institutional arrangements that have been historically developed by various components of the state apparatus. Skocpol and Finegold (1982), for example, use this approach to examine the fate of two New Deal administrations, the Agricultural Adjustment Administration

(AAA), targeting agriculture, and the National Recovery Administration (NRA), targeting industry. The AAA was a New Deal success story, and Skocpol and Finegold argue this success was due to the pre-existing organizational capacity of the USDA and the closely aligned State Agricultural Experiment Stations (SAES) and land-grant colleges, and the fact these resources provide the AAA with a ready-made base of civil-servant experts, up-to-date information, and nation-wide networks. The failure of the NRA is attributed to the lack of these pre-existing organizational capacities.

Gale's (1986; see also Mauss, 1975) work provides a useful means of conceptualizing how these various elements of the institutionalist perspective might come together in the present case. Gale has argued that one response the state may take to social movement agitation is to create a new agency to address movement concerns. These concerns thus become institutionalized in state activity. Even in the face of movement decline, then, we are still likely to get out of this development: (1) bureaucrats interested in pursuing their own careers and protecting and promoting the organizational interests of their agency; (2) institutionalized arrangements that address movement concerns, such as the routinized monitoring of various kinds of social, economic, health, and environmental indicators that I discussed in the section on agenda setting (Kingdon, 1984); and (3) at least some career bureaucrats employed within those agencies who share some

level of identification with movement concerns and goals.

These insights, combined with Kingdon's (1984) work on agenda setting, led me to conclude that in at least some cases environmental crises and controversies may provide opportunities for at least some government agencies and officials to advance organization, career, and personal goals. In the manner of ethnographic content analysis (Altheide, 1987), I returned to my primary and secondary sources to put together the evidence to support this argument. This evidence is presented in the following two chapters.

At the same time, I should point out that not all government action contributed to, or took advantage of, this controversy. As I have previously indicated, the U.S. Department of Agriculture at this time was part of a powerful subgovernment system that supported and defended the use of pesticides. Bosso (1987) has done an exemplary job of examining the political activities of this subgovernment system over the course of most of this century. Furthermore, as I indicated in the previous section, this controversy did move into the depoliticalization stage around mid-1964, a movement that was immediately preceded by three publicly-visible responses to Carson (passage of a $25 million research package on non-chemical controls and pesticide safety, passage of the 1964 FIFRA amendments, and the formation of the Federal Committee on Pest Control), just as Jasper's (1988) model would predict.

The final contribution of the institutionalist perspective, then, was the recognition that while environmental crises and controversies may present opportunities for government agencies and officials pursuing such opportunities it not without risk. For example, if a government official engages in publicly visible activity that promotes the labelling of some condition a social problem but then is unable to follow with any government response to that problem he or she may well end up with a damaged rather than heightened public image. The risk of trying to take advantage of an environmental controversy may be particularly severe for government agencies. One response the Food and Drug Administration could have made to the present controversy, for example, was to argue that they did not have adequate resources to ensure that consumers were not being exposed to unsafe levels of pesticide residues on food. While such an argument might have bolstered their claim to increase resources it was also tantamount to a confession that the public health was jeopardized. This is hardly the kind of public image a government agency wants to promote, both because it threatens their own legitimacy and also might incite public panic, a fate government agencies typically try to avoid at all costs (Edelstein, 1988).

While some government agencies and officials may seek to take advantage of the opportunities created by environmental crises and controversies in the short term, I also argue that

the general pressures are toward reaching some type of resolution in the not-quite-as-short term. This movement is encouraged not only by government officials' and agencies' need to maintain their legitimacy by at least appearing to respond in an efficacious manner to a problem, but also the brevity of policy windows (Kingdon, 1984). While when these windows first open proponents of change may push for their proferred solutions, as time drags on they become increasingly willing to compromise to ensure that at least some changes occur, even if these are relatively minor.

With this final piece of the theoretical puzzle in place I was able to reconfigure the elements of the various literatures discussed in this chapter that had provided valuable insight into at least some of the elements in this case into the integrative theoretical model I introduced in Chapter One. I turn now to a discussion of how this model was used to analyze the controversy that occurred over synthetic organic pesticides in the 1940s, 1950s, and 1960s.

CHAPTER FOUR

CASE STUDY, PART I: 1944-1961

In this and the following chapter I present the findings from my case study of the controversy that occurred over the use of synthetic organic pesticides in the latter part of the 1940s through the 1960s. In the present chapter I provide a general background introduction to pesticides in the U.S. and the major actors involved in controversies over pesticide use. The remainder of the chapter is devoted to covering government action undertaken with respect to pesticides during this time period, and New York Times' coverage of the best known of the new synthetic organics (DDT) in the pre-Silent Spring years. In the following chapter I discuss government action and New York Times coverage in the years immediately following publication of Silent Spring, 1962-1969.

PESTICIDES IN THE U.S.: A BRIEF OVERVIEW

Pesticides, broadly defined as any substance employed for the purpose of poisoning unwanted insects and other animal and plant life, have been used on a small scale since ancient times (Whorton, 1974). We can see the antiquity of such uses

in the following quotation:

> The first records of pesticides come from the ancient Greeks. Pliny the Elder (A.D. 23-79) compiled a list of common compounds like arsenic, sulfur, caustic soda and olive oil used to protect crops. The Chinese later recorded using similar substances to combat insects and fungi. (Weber, 1993:142)

It was not until the latter part of the nineteenth century, however, that pesticides became a fairly common fixture on U.S. farms (Whorton, 1974; Bosso, 1987). This development was preceded and facilitated by changes in agriculture that made crops more vulnerable to insect depredations, including increased monocropping, more intensive farming techniques, and more expansive transportation routes, the latter of which spread pests to new areas where they had few or no natural predators. The pesticides most widely used during this time period were natural inorganic compounds such as lead arsenate and copper sulfate, though some natural organic, plant-derived substances such as pyrethrum and rotenone were also used (Blodgett, 1974; Whorton, 1974; Weber, 1993).

Agriculture's increased reliance on these poisons was assisted by the institutionalization of the fledgling science of economic entomology, which occurred concomitantly with these other developments (Dunlap, 1981). The focus of this new scientific specialization was the systematic development of new, and improvement of old, pest control techniques. Like other varieties of agricultural science, economic entomology was institutionalized in the closely-aligned U.S. Department

of Agriculture (USDA) and land-grant colleges, both created in 1862, and the state agricultural experiment stations (SAES), created in 1887 (Baker, 1962; Ruttan, 1982; Marcus, 1985).

The natural organics and inorganics reigned supreme on U.S. farms from the 1880s through most of the 1940s. Like many sectors of the U.S. economy, however, agriculture was transformed in the years immediately following the Second World War by technological innovations spurred by that war. In the case of pesticides, the key technological innovation was in the development of new synthetic organic compounds, the best-known of which was DDT (Perkins, 1978). The insecticidal capabilities of this compound were actually discovered in 1939, prior to the outbreak of the war, by Paul Mueller, an employee of the Swiss chemical company Geigy. The potential efficacy of the compound was demonstrated to the Swiss in 1941, when it was used to successfully ward off an attack of the Colorado potato beetle in that country. In 1942, the USDA received its first sample of DDT from Geigy (Perkins, 1978).

The USDA, together with economic entomologists in the land-grant colleges and the state Agricultural Experiment Stations, had begun converting their facilities over to war-related research by the early 1940s (Perkins, 1978). The seriousness with which they took this assignment was considerable -- the recent past bore witness to the sizeable toll on both military and civilian populations taken by such insect-borne diseases as typhus during wartime. The first

samples of DDT received by the U.S. government were sent to a special USDA laboratory in Florida, which had already logged ample experience testing other compounds for possible use in the war effort. Once entered into the testing queue, it did not take long for DDT to become distinguished as a compound of unusual promise (Perkins, 1978).

This promise stemmed from a number of traits possessed by DDT that separated it from the older inorganic pesticides and that made it particularly valuable both as a commercial product and as a wartime insecticide. First, it was a broad spectrum poison, meaning it was effective against a wide range of insects. Second, it was persistent, meaning that the chemical remained stable, and therefore capable of killing insects, for weeks or even months after application. Third, it had low acute mammalian toxicity, meaning the chemical could be applied in low doses on and around humans and other warm-bloodied animals without any immediate negative health impacts. Finally, it had low production costs (Perkins, 1978). Ironically, these traits that made DDT and other synthetic organics so appealing to chemical companies, the military, public health officials, and farmers would subsequently be cited by Rachel Carson and other pesticide critics as factors underlying the threat these products posed to humans and the environment.

Given these traits, it is hardly surprising that when the new synthetics were made available for general sale following

the war they were widely adopted for agricultural and other uses (described further below). DDT, while probably the best known of the new compounds, is just one formulation falling within a broader family of pesticides known as the organochlorines, or chlorinated hydrocarbons (Blodgett, 1974). Other organochlorine pesticides include DDD, DDE, heptachlor, dieldrin, and aldrin (Harte et al., 1991). Organophosphates form the second major family of synthetic organic pesticides. These compounds "often have high acute toxicity, but are generally short-lived [not persistent]" (Blodgett, 1974). Examples of organophosphates include malathion and parathion (Harte et al., 1991).

THREE CONSTELLATIONS OF CONCERN: AGRICULTURE, HEALTH, AND THE ENVIRONMENT

In this section I briefly overview the major actors who participated in the post-World War II pesticide controversy. These actors were grouped around three major constellations of concern: agriculture, health, and the environment (Blodgett, 1974; Bosso, 1987). The activities of organizations and individuals located within the first constellation of concern were primarily directed toward the development of pest control technologies. Activities in the other two constellations of concern were directed toward identifying impacts of pesticide use on non-target organisms -- humans in the former case, wildlife in the latter case. The government bureaucracies that correspond to these three constellations are the U.S.

Department of Agriculture (USDA); Health, Education, and Welfare (HEW); and the Department of the Interior (USDI).

Agriculture

Pesticides first made their appearance in this country in connection with agriculture, and for the first several decades of use were viewed as a strictly agricultural concern (Bosso, 1987). Creation, implementation, and enforcement of pesticide policy fell to those actors most intimately involved in pesticide use, a situation not seen as troublesome at the time since no outsiders displayed any interest in the issue. Given these conditions -- a small group of highly committed actors (discussed below) with extensive common interests, and an absence of any contending voices -- it is not surprising that a powerful subgovernment system formed around pesticide policy issues (Bosso, 1987).

The pesticide subgovernment system was further strengthened by mutual commitment to the pesticide paradigm, that is, the belief that pesticides were absolutely necessary for modern agriculture and were also perfectly safe (Bosso, 1987). This paradigm was predicated on the assumption that the best way to deal with insect competitors and disease vectors was by killing the insects. The role the USDA was to play on the pesticide front was clear to this subgovernment system: facilitation of farmer access to better pest control technology. In addition to the USDA and farmers and farm organizations such as the Farm Bureau, this subgovernment

system included Congressional patrons of agriculture serving on such key committees as the House Agricultural Committee, agricultural scientists located at the land grant colleges and the state agricultural experiment stations, and the pesticide industry (Rowland and Dubnick, 1982:216; Bosso, 1987). The broader agricultural subgovernment system also included food marketers and processors and other agricultural industries. The agricultural bloc formed a particularly powerful subgovernment system in the first couple of decades following World War II (Hansen, 1991).

Health

Those who supported the pesticide paradigm enjoyed about a 40-year period when their interests on pesticide policy reigned supreme (Bosso, 1987). By the mid-1920s, however, a new constellation of actors, concerned about potential health impacts of pesticide residues on food, was starting to gel (Whorton, 1974). Lutts' (1985:212) report that "[i]n the early decades of their use these toxic chemicals could sometimes be found as visible coatings on farm produce in retail markets" provides some indication of the conditions that gave rise to this second set of concerns. Major actors located within this constellation include HEW's Food and Drug Administration (FDA), state and local health officials, physicians, academic scientists in health-related fields, and consumer organizations and advocates.

It should be pointed out, however, that not all the

individuals within these groups shared concerns about the health impacts of pesticides. There seemed to be as many health officials, physicians, and academic scientists willing to testify that pesticides were safe as there were willing to testify that pesticides were not safe (Whorton, 1974). Such debates were particularly common when attention shifted from the question of acute impacts, or immediate poisoning, to chronic or long-term impacts.

One area within the health community in which this division was particularly noticeable was the federal government's health agency. HEW had two divisions that addressed pesticide issues: the FDA and the Public Health Service (PHS). Of these two divisions, the FDA consistently took a more cautious and critical stance on pesticides than the PHS (Whorton, 1974). FDA's primary involvement with pesticides was in terms of regulating residues on food products; in addressing this mandate it gave particular weight to the possibility of chronic impacts. The PHS, in contrast, emphasized acute impacts in its evaluation of pesticide safety (Whorton, 1974). Furthermore, in the years following World War II the PHS made use of new synthetic organics such as DDT in spray campaigns to wipe out insect vectors. Beginning in 1945, for example, the PHS worked in conjunction with state health agencies to "wage war" against the malarial-carrying mosquito in the southern United States. According to PHS claims in a 1951 New York Times' article, between 1945 and

1950 6,220,000 houses in the U.S. were sprayed with DDT as part of this campaign (New York Times, 7-11-1951:12).

As the preceding discussion illustrates, there were two major factors underlying the lack of consensus about pesticides in the health community. First, the scientific evidence did not provide clear-cut answers to questions about health impacts, particularly chronic impacts, thus allowing for multiple interpretations. Second, pesticides were used in ways that both potentially threatened human health (as residues in food products) and promoted better health (in campaigns against insect vectors). Simultaneous interpretations of pesticides as a "boon" and a "bane" were thus available in the health community, and individual members of that community disagreed about which of these interpretations was the correct one.

The Environment

The last constellation of actors to join the pesticide fray were those concerned with environmental impacts of pesticide use. Their entrance was not made until the years following World War II, and must be historically situated within the changes in pesticide practices that accompanied the switch to the new synthetic organics at this time period. Prior to this time, use of pesticides had largely been limited to agricultural settings. The cost, application difficulty, and high mammalian toxicity of these compounds made their widespread use prohibitive (Dunlap, 1976, 1981). Many of the

new synthetic organics did not suffer from these limitations, however, and therefore came to be used far more extensively than their predecessors. Efforts to limit insect destruction of economically-valuable plant and animal life was no longer confined to agriculture but extended to forests and rangeland as well. USDA-initiated treatment/eradication campaigns resulted in the application (often, though not always, through aerial spraying) of pesticides to millions of acres of forests and rangeland. Of course, these treatment campaigns concomitantly meant massive application of pesticides to wildlife habitat, and it is these actions that brought to the fore questions about potential environmental impacts of pesticide use.

The government agency with the primary responsibility for addressing potential impacts of pesticides on wildlife and wildlife habitat (i.e., the natural environment) was the U.S. Department of Interior's (USDI) Fish and Wildlife Service (FWS) (Dunlap, 1976, 1981). Other actors within this constellation included biologists and other ecologically-oriented academic scientists and major conservation organizations such as the Audubon Society.

DETECTING THE PROBLEM: INSTITUTIONALIZED MONITORING MECHANISMS

In the previous section I identified three government agencies (the USDA, the FDA, and the PHS) who had a long history of involvement with pesticides prior to the 1962

publication of Carson's Silent Spring, and a fourth (the USDI's FWS) which became involved in pesticides-related research in the post-World War II era. In this section I turn my attention to a more detailed discussion of the kinds of pesticide-related activities these agencies undertook and how the existence of these institutionalized monitoring mechanisms stemming from research and regulatory activity resulted in the USDA, FDA, and FWS being among the earliest claimsmakers to identify potential negative impacts of the synthetic organic pesticides. My discussion in this section is based on institutionalist analyses of the state that focus on "the organization of government institutions and the rules and procedures that govern their behavior" (Hoberg, 1992:10), and how these rules and procedures influence political conflicts and outcomes. This latter component is developed further in the two sections that follow this one.

Agriculture

> The Federal Government has engaged in three major activities regarding pesticides: (a) research and development; (b) pest control; and (c) regulation (Blodgett, 1984:200).

The USDA was the federal agency with the longest history of involvement with pesticides, and had been undertaking activities in all three of these major areas for a considerable period of time before the 1962 publication of Silent Spring (the USDA's involvement in pest control is discussed further in the section on "the environment"). The agency was engaged in research on and development of pest

control techniques by the late 19th century (Whorton, 1974). It assumed some limited regulatory functions by the early twentieth century (Bosso, 1987).

The goal of USDA regulatory activity was "to protect the farmer from adulterated or ineffectual pesticides" (Blodgett, 1974:200). The USDA was to accomplish this via the registering of pesticide products and product labels, as mandated first under the 1910 Federal Insecticide Act (FIA) and its subsequent replacement, the 1947 Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). As the registration requirement implemented under these Acts suggests, they are both essentially "truth in advertising" or "labelling" laws (Bosso, 1987). FIFRA required that the manufacturers of pesticide products acquire premarket clearance for their product labels from the USDA. The USDA could refuse to register a product and its label if it deemed the product or its proposed uses were unsafe or ineffective. However, FIFRA contained a provision that allowed for "protest registration", which meant that a manufacturer or retailer could go ahead and market a product that the USDA had refused to register. Theoretically, the USDA could take the manufacturer or retailer to court to try to stop the sale of the product, but such activities took time and the USDA bore the burden of proving that the product was, in fact, unsafe and/or ineffective (Blodgett, 1974; Bosso, 1987).

As I have previously indicated, members of the pesticide

subgovernment system saw the USDA's role as facilitating farmers' access to pesticides (Bosso, 1987). This assignment placed the USDA as a supporter and defender of pesticides, and much of the agency's activities over the course of the 20th century reflect this stance (Bosso, 1987; Hoberg, 1992). It would be wrong, however, to assume all USDA, land-grant, and SAES personnel were such vociferous defenders of pesticides that they were totally blinded to the possibility of negative or unintended side effects of pesticide use. Indeed, part and parcel of their assignment to facilitate farmers' access to pesticides was testing of various pesticides and pest application techniques to assure they did not result in such unintended deleterious impacts as damage to economically-valuable plants, damage to domestic livestock, and accumulation in soils. By the time the new synthetics arrived on the scene this type of routine testing was well established.[4]

An example of this is provided by Russell (1993:47), who indicates how researchers in the USDA's Bureau of Entomology and Plant Quarantine (BEPQ) "had stressed the importance of insect predators and parasites for keeping pest insects in

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[4] Scientists from the USDA, Agriculture Experiment Stations, and the land grant colleges provide a more extensive overview of their testing procedures regarding pesticides in testimony before the House Select Committee to Investigate the Use of Chemicals in Food Products (1951a, 1951b) and before the Subcommittee on Reorganization and International Organizations of the Committee on Government Operations, United States Senate (1964).

check" prior to World War II. They worried about the impact of such broad spectrum poisons as DDT on these natural forms of insect control (see also Bishopp, 1952). When limited quantities of DDT were made available for agricultural research in the late summer of 1943 (most of the research attention at this time was on the pesticide's potential use as a war-time insecticide for health purposes), USDA, SAES, and land-grant scientists subjected the compound to their usual set of tests. This research indicated that DDT had the potential for troublesome and unintended impacts on bees (Todd and McGregor, 1952), livestock (Carter et al., 1948; Shepherd et al., 1949; Radeleff et al., 1955), and plants and soils (Cullinan, 1949; Stahler and Whitehead, 1950; Ginsburg and Reed, 1954).

By the fall of 1944 the USDA had still not endorsed general agricultural use of DDT, both because agency personnel felt they did not yet have sufficient information on its impact on insects and plant life, and because repetition in 1944 of some of the limited experiments performed in 1943 did not always produce consistent results (Oil, Paint and Drug Reporter, 1944; Soap and Sanitary Chemicals, 1945; Perkins, 1978; Russell, 1993). While such hesitation on the part of the USDA did not last long (particularly given the overwhelming demand for DDT on the part of the agricultural community), these early concerns were disseminated through the New York Times (as I explain further in the section entitled

"softening up the public").

Health

As was the case with agriculture, routinized monitoring mechanisms designed to detect potential health impacts from pesticides (particularly with respect to residues on food products) were developed and in place long before the movement to the new synthetic organics. The first legislative act that allowed the government some limited ability to address pesticide residues on food shipped in interstate commerce was the 1906 Pure Food and Drug Act (PFDA). Under the provisions of this act the USDA's Bureau of Chemistry (which was charged with the enforcement of the Act) could seize agricultural food products it deemed to contain dangerously high levels of pesticide residues. However, if the seizement action was taken to court the Bureau of Chemistry bore the burden of proving to the jury that its assessment that the food posed on unwarranted public health risk was indeed a valid one (Whorton, 1974).

The first legislative act that allowed the government to set legally-binding tolerance levels for pesticide residues on agricultural food products was the 1938 Food, Drug and Cosmetic Act (FDCA) (Whorton, 1974; Bosso, 1987). This act was enforced by the Food and Drug Administration (FDA), a new division created within the Agriculture Department in 1927 to administer the Pure Food and Drug Act (for reasons discussed further in the section on "policy battles") (Whorton, 1974).

This regulatory mandate resulted in the establishment of institutionalized monitoring mechanisms. These mechanisms included both the examination of toxicological data submitted by pesticide manufacturers as well as some agency research.

A second federal agency that was also involved in issues pertaining to pesticides and health was the U.S. Public Health Service. This agency's evaluation of the new synthetic organics was, on the whole, much more favorable than that of the FDA's. First, whereas the FDA was particularly concerned about chronic impacts of the ingestion of small quantities of pesticide residues on food products over time, the PHS focused on acute impacts (Whorton, 1974). To determine these impacts the PHS undertook clinical field studies of the most occupationally exposed individuals (e.g., field hands who applied pesticides, workers in plants that manufactured pesticides). If these individuals failed to display any problematic health symptoms, the PHS concluded that the far-lower levels of pesticide exposure experienced by the average American must certainly be "safe".

Second, following World War II the PHS used and promoted the use of the new synthetics in campaigns against disease vectors. A July 11, 1951 (p. 12) New York Times article, for example, reports on a six-year effort by the PHS and southern states to eradicate the mosquito vector of malaria. According to this article, over 6 million homes had been treated with DDT as part of this control campaign. Hence, the differential

involvement of the PHS and the FDA in pesticides encouraged the former to emphasis those characteristics of the new synthetics such as DDT that suggested it was a "boon" to humankind, while the latter was more likely to focus on its "baneful" aspects.

Both of these agencies were involved in early testing of health impacts of DDT following the government's receipt of this pesticide from Geigy in 1942 (Perkins, 1978). These tests did show the product to have low acute mammalian toxicity, and given the urgent need for a lousicide in Europe this finding was enough to encourage Department of Defense promotion of DDT for that purpose. These early tests also revealed potentially problematic properties, however, especially its tendency to accumulate in body fat, that suggested the potential for chronic impacts (see Nelson et al., 1944; Draize et al., 1944; and Russell, 1993). "As early as 1944 [FDA] officials were expressing, privately, reservations about using DDT until complete data on its chronic toxicity were available" (Dunlap, 1981:63; see also Bosso, 1987). These concerns are reflected in the following testimony of Dr. Paul B. Dunbar, Commissioner of the Food and Drug Administration, in hearings before the House Select Committee to Investigate the Use of Chemicals in Food Products (the Delaney Committee) in 1951:

> As experience was acquired [with DDT], we found that it has the property, if the animal is exposed to it for any length of time, of accumulating in the body fats, and it may accumulate there to a degree that is definitely

> injurious; and one surprising and alarming thing was that milk cattle, cows that are fed silage which has been sprayed with DDT, or even if the cows have been sprayed externally to keep down insect infestation of the animal, will accumulate DDT in the fat, and then eventually excrete it in milk. (U.S. Congress, 1951a:31)

In 1950, researchers from the FDA's Division of Pharmacology found that trace amounts of DDT were showing up in the body fat of the average American as well as in the breast milk of nursing mothers (Dunlap, 1981), hardly a comforting finding to an agency already worried about chronic impacts of this pesticide. Concern generated by these findings led the FDA to push for changes in the regulatory policy governing pesticide residues on food, activities I discuss further in the section entitled "Policy Battles".

The Environment

While the USDA and the FDA had both been involved in regulation of and research on pesticides prior to widespread adoption of the synthetic organic pesticides, there was a third agency, the U.S. Department of Interior (USDI) that only became involved in pesticide research and regulation in the post World War II era. The division of Interior that was primarily involved in pesticide research was the U.S. Fish and Wildlife Service (FWS). USDI's/FWS's entrance into the pesticide arena was a result of changes in pest management practices due to the synthetic organics (Dunlap, 1976, 1981). As I have previously explained, the advantages of the new synthetic organics over the older natural inorganic pesticides included the former's low production costs, ease of

application, broad spectrum action, and low acute mammalian toxicity (Perkins, 1978). These characteristics encouraged more extensive use of the synthetic organics, including relatively novel uses such as pesticide treatments of wilderness areas (swamps, rangelands, and forests), which for the first time subjected wildlife to extensive exposure to pesticides (Dunlap, 1981).

The USDI implemented research programs to monitor the impact of these spray campaigns on wildlife in 1944 (Dunlap, 1981:272; see also Lear, 1993). Initially, these research efforts were quite limited. In part, this was due to limited funds to conduct such research, a condition that the USDI and its Congressional supporters sought (with some degree of success) to rectify in the latter part of the 1950s (Blodgett, 1974). More consequential at this time, however, was the USDI's position, based on agency personnel's initial assessment that the impact of pesticides on wildlife were not likely to be extensive, that limited time and resources were best spent on other pursuits, with a particular focus on predator control (Graham, 1970; Dunlap, 1976). This assessment stemmed from the agency's initial focus on acute and localized effects, that is, "immediate mortality in sprayed areas, and changes in wildlife populations exposed to repeated sprayings" (Dunlap, 1981:272).

This sense of complacency did not last. Continued FWS monitoring revealed that the acute impacts of these spray

programs on aquatic and other wildlife (e.g., numbers of death due to poisoning) were more severe than initially anticipated (Cottam and Higgins, 1946; Dunlap, 1981). Researchers at the FWS's Patuxent Wildlife Research Center (Maryland) released findings in 1951 showing a 26 percent decline in bird populations on an experimental tract of land treated with repeated sprayings of DDT over a five year period (Dunlap, 1981:93). One of the wildlife biologists at Patuxent, James DeWitt, undertook studies of the effect of four chlorinated hydrocarbons -- DDT, dieldrin, aldrin, and endrin -- on captured quail populations. By 1955 he had found birds exposed to even small quantities of these substances (e.g., diets composed of 0.002 percent DDT) exhibited reproductive failures (DeWitt, 1955, 1956; Dunlap, 1981).

The FWS's concerns were further bolstered by two massive eradication campaigns undertaken by the USDA in the mid-to-late 1950s -- the first against the gypsy moth in northeastern forests, the second against the fire ant in the southeast (Graham, 1970; Dunlap, 1976, 1981; Bosso, 1987; Baumgartner and Jones, 1993). The following quotation from the New York Times provides a good indication of the extensiveness of the gypsy moth campaign:

> 65 airplanes roared into the sky in a massive spraying campaign known as Operation Gypsy Moth... About $5,000,000 was being spent on a DDT-spraying program in New York, New Jersey, and Pennsylvania to stop the spread of the gypsy moth... The spraying area covers about 2,540,000 acres in New York and 410,000 acres in New Jersey and Pennsylvania. (New York Times, 4-24-57:35)

The fire ant campaign, funded under the Fire Ant Eradication Act passed in 1957, was an equally massive affair. In proposing the campaign, the USDA estimated that "some 20 million acres required treatment" (Bosso, 1987:88). Bosso estimates that the annual USDA expenditure on the campaign during the first three years was $4-5 million.

Both of these campaigns resulted in "huge fish kills, enormous crop damage, and the devastation of wildlife" (Baumgartner and Jones, 1993:96). These impacts, furthermore, were occurring at the same time as research such as that by James DeWitt (1955, 1956) was suggesting the potential of these pesticides to have long-term impacts on wildlife populations and the environment. As FWS biologists became increasing aware of the environmental persistence and mobility of these compounds, their tendency to bioaccumulate in body fat and biomagnify up food chains, and their potential for reproductive (mutagenic and teratogenic) impacts, their opposition to widespread use of the compounds mounted.

Before concluding this section, I should point out that this concern with synthetic organic pesticides was not shared by all divisions of the Department of Interior, or even of the FWS. While wildlife biologists within FWS displayed consistent skepticism of the claims that DDT was harmless (Lear, 1993), their concern was not shared by the predator control people (Graham, 1970). Indeed, the predator control division made extensive use of pesticides in their effort to

combat predators threatening sheep and cattle ranches. Still, as Campbell's (1985) and Kingdon's (1984) work would suggest, the presence of even a few individuals within an agency pushing for change can make a difference over the long run.

SOFTENING UP THE PUBLIC: NEW YORK TIMES' COVERAGE OF DDT, 1944-1961

In the preceding section I examined how institutionalized monitoring mechanisms utilized by the USDA, FDA, and USDI/FWS prior to the 1962 publication of Silent Spring facilitated those agencies' early detection of potential negative impacts on nontarget organisms stemming from the use of the new synthetic organic pesticides. In this section I examine the dissemination of negative or cautious claims made about the best known of the new synthetic organics, DDT, through one popular news source, the New York Times.[5] While my primary focus in this analysis is on negative or cautious claims I also present information on positive claims in order to provide a more accurate picture of the nature of media

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[5] I use the joint term "negative or cautious claims" to indicate that claimsmakers raising these concerns were not necessarily arguing against use or even extensive use of synthetic organic pesticides. Some of these claimsmakers, most notably the USDA, also disseminated claims that promoted DDT's use, for example, by reporting on the variety of types of insects killed by DDT and proper application methods (New York Times 9-2-45:VI,9; 9-25-45:22; 9-26-45:V,9). Given this, it is reasonable to assume that the USDA's dissemination through the New York Times of information about unintended side effects of DDT use was not meant to cast the pesticide in a negative light but only to emphasize DDT products must be used "with caution" if these unintended side effects were to be avoided or minimized.

coverage of DDT over this time period (1944-1961).

The first New York Times' article on DDT was printed on February 3, 1944 under the title "Tells of anti-vermin powder" (p. 21). DDT proceeded from there to receive extensive media attention over the next several years. The New York Times published ninety-six articles on DDT during its first three years of coverage (1944-46), fifty-six of these in 1945 alone. One hundred forty-five articles on DDT were printed in that publication by the end of the 1940s, and another 80 appeared in the following decade. Figure 1 shows the distribution of pesticide-related articles published in the three major newsweeklies and the Reader's Digest over the period 1945-1969.

As I indicated in the first section of this chapter, DDT's initial introduction into this country was in connection with war-related efforts. At the time media coverage of DDT began, of course, war-related stories were the prominent news item. Coverage of the pesticide was no doubt encouraged not only because of its utilization in the war effort but also because of the positive nature of its contribution. DDT's deployment in campaigns against malaria and typhus sent positive messages about the U.S.'s capacity to win the war, the probability of soldiers surviving to see the end of the war, and about American ingenuity in general. This optimism was portrayed in such headlines as:

> "Science in Review: DDT, the Army's Insecticide Powder, Strikes a Blow Against Typhus and for Pest Control" (6-4-

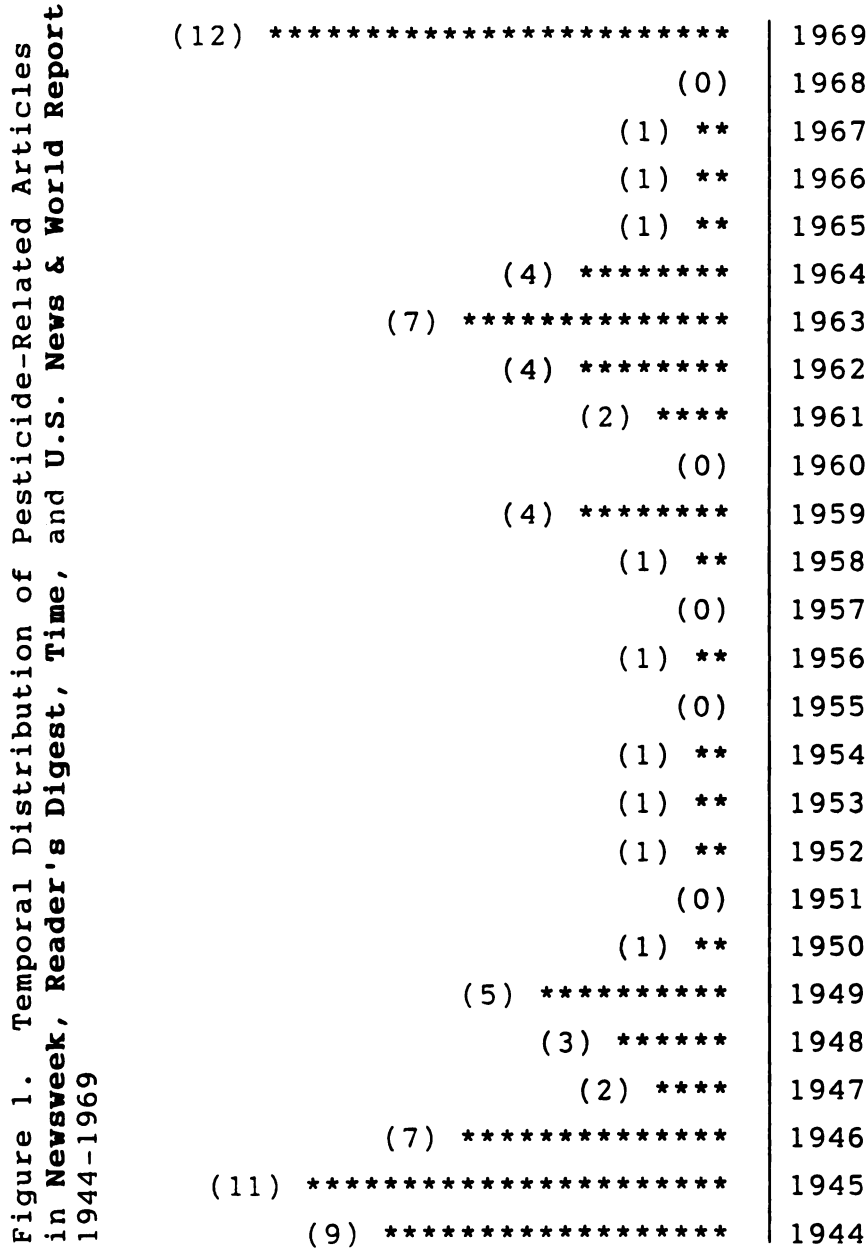

Figure 1. Temporal Distribution of Pesticide-Related Articles in **Newsweek, Reader's Digest, Time,** and **U.S. News & World Report,** 1944-1969

44:E9), **"The Conquest of Typhus"** (6-4-44:E8), and **"Army to Use DDT Powder on Malaria Mosquitos"** (8-1-44:10).

Not surprisingly, the vast majority of initial media coverage stressed the virtues of DDT. The generally exuberant sometimes bordering on euphoric treatment of the pesticide by the press was conveyed in such headlines as:

> **Saipan Cleansed: Airplanes Sprayed Island with DDT, Killing Every Insect** (New York Times, 12-3-44:IV,E9), **Flies on Mackinac Island Extinguished with DDT** (New York Times, 8-10-45:10), **Chemists Say DDT Could Save 1 to 3 Million Lives Each Year** (New York Times, 8-29-45:25), **DDT Increased Potato Crop** (New York Times, 12-5-45:22), and **Entire Town Sprayed with DDT** (New York Times, 8-21-46:24).

A quantitative assessment of the overwhelmingly positive nature of this publication's coverage of DDT is reflected in the finding that 76 percent of the 228 articles on DDT published in the New York Times during the years 1944-1961 contained either exclusively or largely positive claims about the pesticide. Fifty-five percent of these articles contained only positive claims. Corresponding percentages for articles published during the first three years of coverage (1944-1946) were 89 percent and 73 percent, respectively.

Even in these early years, however, there was some dissemination of potential problems associated with use of DDT in the New York Times. The first New York Times' article to carry negative claims was published on May 6, 1945 (p. 35). The article, entitled **"Woman Advances Wildlife Studies: Scientists in Federal Service Report Gains in Knowledge of Furs, Birds, and Diet"** reported on findings by a FWS staff

Table 2. Examples of **New York Times'** Headlines Portraying Negative or Cautious Coverage of DDT, 1945-1958

Dangers Inherit in DDT (8-3-45:16)

Fish Killed by DDT in Mosquito Tests (8-9-45:23)

They Still Buzz in: Mosquitos Invade Jersey Homes and Offices Despite DDT (8-10-45:17)

Care Urged in DDT Use: Botanic Garden Head Says it May Destroy Bees (9-20-45:25)

DDT Spray Called Injurious to Birds -- Experts Warn Insecticide May be Fatal to Fish -- Further Tests Urged (10-23-45:10)

Man Killed by DDT Fumes (8-26-46:25)

Farmers Warned on DDT: Expert Says it Appears in Milk, Meat After Crop Dusting (5-25-47:52)

Bird Deaths Start Insecticide Tests: Audubon Society Sprays Areas to Determine Which Solutions Spare Feathered Life (7-5-48:17)

DDT-Resisting Flies Call on Many Areas in Sicily (7-8-48:3)

Doctors to Study DDT as a Food Poison (3-3-49:53)

Public Warned on DDT (3-10-51:11)

DDT Called Dangerous (11-24-51:12)

Long Islanders Ask Court to Halt DDT War on Moth as Health Risk (5-9-57:1)

Witness Believes DDT is in City Food (9-13-57:25)

DDT Spray Called Cancer Menace (2-14-58:25)

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biologist, Mrs. Lucille Stickel, that DDT had an "extremely toxic" effect on fish and other aquatic life when applied to stagnant waters in order to kill mosquitos. The first New York Times' headline critical of DDT, **"Dangers Inherent in DDT"**, was published on August 3, 1945 (p. 16), while the first headline critical of DDT accompanying a regular feature story, **"Fish Killed by DDT in Mosquito Tests"** was published six days later, on August 9, 1945 (p. 23). Further examples of negative headlines are portrayed in Table 2.

While the predominant theme in the New York Times was one of support of and exuberance for DDT, almost one-fourth (24 percent) of the articles on DDT published during the years 1944-1961 presented information on the pesticide that was completely or largely negative or cautious in nature. Furthermore, as is conveyed in Table 3, the prevalence of these articles increased over time. Table 3 examines positive and negative coverage of DDT in the New York Times over four time periods: 1944-1949, 1950-1954, 1955-1958, and 1959-1961. This particular condensation of time was chosen because the first and third of these periods (1944-49 and 1955-58) correspond to the two peak periods of negative coverage of DDT (see Table 5).

As can be seen in Table 3 the ratio of positive to negative articles decreased substantially over this time period. In the earliest time period (1944-49) the ratio of positive to negative articles was almost five to one, while by

Table 3. Comparison of Positive and Negative Coverage of DDT in the **New York Times**, 1944-1961

Years	Percent of Positive Articles With Some Negative Coverage (Base)	Percent of Negative Articles With Some Positive Coverage (Base)	Ratio of Positive to Negative Articles
1944-1949	17.1 (117)	66.7 (24)	4.9 to 1
1950-1954	13.0 (23)	30.0 (10)	2.3 to 1
1955-1958	53.5 (30)	31.8 (22)	1.4 to 1
1959-1961	0.0 (3)	0.0 (2)	1.5 to 1

the last two time periods (1955-58 and 1959-61) this rate had declined to approximately one and half to one. In addition, this table portrays changes in the extent to which articles conveying positive or negative claims about DDT also incorporated contending claims. The first column of Table 3 examines the percent of exclusively or largely positive articles that incorporated some negative or cautious claims. An example of an article that is largely but not completely positive is the July 5, 1945 piece entitled **"New insecticide tested on malaria mosquitos"**. This article reported on USDA tests to determine the efficacy of DDT against malaria-carrying mosquitoes, the development of new spray equipment that allowed airplanes to treat 500 acres or more at a time,

and the effectiveness of DDT against not only adult mosquitos but also mosquito larvae. While the general tone of the article is therefore positive, it also cautions that the insecticide may not be suitable for broadcast spraying, "because of the possibility that it might upset the balance of nature by killing beneficial insects and fish, birds and other wildlife" (New York Times, 7-15-45:16).

The second column in Table 3 examines the obverse of the first, that is, the percent of exclusively or largely negative articles that contained some positive claims. If we remove (because of the small number of cases) the time period 1959-61 from consideration, we see the general trend over the years 1944-1961 is an increasing likelihood that positive articles will also include some negative or cautious claims about DDT and a decreasing likelihood that negative articles will contain positive claims about DDT. Baumgartner and Jones (1993) report a similar increase in coverage of negative claims in popular magazine articles on pesticides over this time period.

Table 4 reports the types of negative or cautious claims being disseminated in the New York Times over the time period 1945-1961. These claims have been divided into four broad topic headings: wildlife impacts, residues and health impacts, efficacy, and agricultural concerns. Because it is likely that laypeople's alarm over pesticide use will increase as they are confronted with more numerous, diverse, and varied

Table 4. **New York Times'** Coverage of Negative or Cautious Claims About DDT, 1945-1961

Claim	Year First Appeared	Initial Claimsmaker	Total Number of Times Claim Appeared, 1945-1961
WILDLIFE IMPACTS			
Direct Poisoning and Destruction of Fish and Wildlife	1945	USFWS	46
Indirect Destruction of Fish and Wildlife Through the Food Chain	1946	SAES	5
Upsets Balance of Nature	1945	USDA	11
Kills, or is Harmful to, Beneficial Insects (Excluding Parasites and Predators)	1945	USDA	14
Kills Insect Parasites and Predators	1945	Letter to the Editor	13
Reproductive Failure	1960	Supreme Court Justice	1

(Continued)

Table 4. **New York Times'** Coverage of Negative or Cautious Claims About DDT, 1945-1961 (Continued)

Claim	Year First Appeared	Initial Claimsmaker	Total Number of Times Claim Appeared, 1945-1961
RESIDUES & HEALTH IMPACTS			
Residues on Plants and Food	1945	FDA	16
Contamination of Milk	1946	Private Industry Scientist	19
Contamination of Meat	1947	USDA	5
(Potentially) Harmful to People	1945	Letter to the Editor	29
Accumulates in Body Fat	1950	FDA	3
Carcinogenic	1958	Medical Personnel and the FDA	1
EFFICACY			
Not Efficacious	1945	Unknown	4
Insect Resistance	1948	Italian Public Health Institute	25

(Continued)

Table 4. **New York Times'** Coverage of Negative or Cautious Claims About DDT, 1945-1961 (Continued)

Claim	Year First Appeared	Initial Claimsmaker	Total Number of Times Claim Appeared, 1945-1961
AGRICULTURAL CONCERNS			
Accumulates in Soils	1945	USDA	8
Injurious to Some Plants	1945	USDA	10
TOTAL NUMBER			**210**

routes by which pesticides might possibly wreak harm on humans or the environment, Table 4 also includes the more specific claims subsumed under the broad topic headings. The distinction between these more specific claims within a topic area is not always conceptually neat or mutually exclusive. All the specific problems identified under "wildlife impacts" could, for example, be subsumed under the general problem heading of "upsets the balance of nature". My coding for distinct claims under these broader topic headings was based on the extent to which claims could be distinguished from each other according to either slightly different, or more concretely specified, routes of impact, and/or slightly different impacts.

Beyond indicating the range of negative or cautious claims appearing in the New York Times during the period 1944-1961, and the number of times each of those claims appeared during this time period, Table 4 provides two other important pieces of information. First, it gives yet another indication of the early appearance of many of these negative or cautious claims in this particular popular news source. Of the sixteen distinct types of problems identified in this table, half first appeared in the paper in the year 1945, while 81 percent had appeared in print by the end of 1947. The second important element to note from this table is the frequency of government agencies among those initially making negative or cautious claims (that is, the claimsmaker attributed to making

the claim the first time it appears in the paper). Of these, the USDA occurs the most frequently. Of these 16 problem areas, the USDA constituted the initial claimsmaker for almost one-third (31 percent). The USDA and the closely aligned state agricultural experiment stations (SAES) accounted for 37.5 percent of initial claims, while the USDA, the FDA, and the FWS account for 50 percent of initial claims.

Table 5 provides further indication of the prevalence of the USDA in disseminating negative or cautious claims to this particular media source, at least in the early years of coverage. As can be seen in this table, there were two peak periods of negative coverage about DDT over the time period 1945 through 1961. The first of these periods was from 1945-1949, while the second was from 1955-1958. Of the 99 negative or cautious claims about DDT printed in the New York Times during this first time period, almost one-third were attributed to the USDA. Again, if we include with the USDA the closely aligned SAES, that percentage increases to 41 percent. Including other federal agencies (but excluding the SAES) again puts the percentage at just under 40 percent. All told, the USDA, the SAES, HEW/FDA, PHS, and the USDI/FWS accounted for almost 50 percent of all negative or cautious claims about DDT appearing in the New York Times over the period 1945-49.

The second peak of negative coverage occurs from 1955 to 1958. Most of the articles published in this time period are

Table 5. Number of Times Various Claimsmakers Raised Negative or Cautious Claims About DDT in the **New York Times**, 1945-1961

Claimsmaker	1945-49		1950-54		1955-59		1959-61		Total	
	N	%	N	%	N	%	N	%	N	%
USDA	32	32.3	3	14.3					35	16.7
SAES	9	9.1							9	4.3
HEW/FDA	2	2.0	2	9.5	1	1.2	2	22.2	7	3.3
USPHS	4	4.0			1	1.2			5	2.4
USDI/FWS	1	1.0	2	9.5	1	1.2			4	1.9
Armed Forces			1	4.8					1	0.5
Supreme Court Justice							5	55.6	5	2.4
State Government	1	1.0	1	4.8	3	3.7			5	2.4
Local Government	7	7.1			1	1.2			8	3.8
University Scientists/ Scientific Association	1	1.0	2	9.5	4	4.9			7	3.3

(Continued)

Table 5. Number of Times Various Claimsmakers Raised Negative or Cautious Claims About DDT in the **New York Times**, 1945-1961 (Continued)

Claimsmaker	1945-49		1950-54		1955-59		1959-61		Total	
	N	%	N	%	N	%	N	%	N	%
Museums/Botanical Gardens	3	3.0			17	21.0			20	9.5
Medical/AMA	7	7.1	6	28.6	3	3.7			16	7.6
Private Industry Scientist/ Chemical Industry	3	3.0			1	1.2			4	1.9
Environmental Organization	11	11.1			3	3.7			14	6.7
Residents, Gypsy Moth Campaign					25	30.9	2	22.2	27	12.9
Letter to the Editor	6	6.1			4	4.9			10	4.8
NYT Editorial			1	4.8	1	1.2			2	0.9

(Continued)

Table 5. Number of Times Various Claimsmakers Raised Negative or Cautious Claims About DDT in the **New York Times**, 1945-1961 (Continued)

Claimsmaker	1945-49		1950-54		1955-59		1959-61		Total	
	N	%	N	%	N	%	N	%	N	%
International	1	1.0	2	9.5	1	1.2			4	1.9
Unknown	11	11.1	1	4.8	15	18.5			27	12.9
TOTAL	99	99.9	21	100.1	81	99.7	9	100.0	210	100.1
Percent of Total		47.1		10.0		38.6		4.3		

related to protests over the USDA's spray campaign against the gypsy moth then being waged in northeastern forests. As can be seen in this table, virtually all of the claimsmakers raising negative or cautious claims by this time period were non-governmental. Indeed, not quite 4 percent of these claims were made by federal agencies, and even when we include state and local government as claims-makers only 8.6 percent of all claims were made by government agencies or officials.

No negative or cautious claims attributed to the USDA appeared in the New York Times between the years 1955 through 1961. One possible explanation for this is as opposition to DDT in general and the USDA's spray campaign in particular mounted, the USDA became increasingly reluctant to put ammunition in the hands of its opponents. Despite lack of any negative or cautious claims from the USDA in the latter part of this time period the USDA is still responsible for the largest number of negative or cautious claims appearing in the New York Times over this whole time (1945-1961), accounting for 16.7 percent of the total (see Table 5, column 5). Residents living in areas sprayed in the gypsy moth campaign and unknown claimsmakers tied for second place, each accounting for 12.9 percent of the total.[6] Claimsmakers associated with museums and botanical gardens came in third, with 9.5 percent of the total. The reason for the prevalence

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[6] Claimsmakers were labelled as "unknown if reporters did not specify in articles the sources of particular claims or other information.

of this category is that one of the most vocal critics of the gypsy moth campaign, Robert Cushion Murphy, was a naturalist employed by a botanical garden.

So far, the findings reported in this section pertain to media coverage of DDT, the best known of the synthetic organic pesticides. There is, however, one other important pesticide-related media event occurring during this time period. Generally referred to as "the Great Cranberry Scare of 1959", this event was set into motion by an agency that did not have extensive public visibility in media coverage of DDT -- the FDA. The Great Cranberry Scare had its impetus in the Delaney Clause of the 1958 Food Additive Amendments to the Food, Drug and Cosmetic Act. The Delaney Clause directed the FDA to set zero tolerance levels for any food additive demonstrated to be carcinogenic (Blodgett, 1974). While this clause was not originally directed toward pesticide residues, such an application was subsequently made by the FDA. In 1959, the FDA determined that the herbicide aminothiazole, used on cranberry bogs, was carcinogenic and accordingly set a new zero tolerance level for the compound (Bosso, 1987). The FDA took their concerns about possible contamination of some cranberries to the public in early November, 1959, just before the start of the lucrative Thanksgiving season, as seen in the following quotation from a page one New York Times article headlined **"Some of Cranberry Crop Tainted by a Weed-Killer, U.S. Warns"**:

> The Federal Government warned the public today that some cranberries grown in Washington State and Oregon had been contaminated by a weed-killer that induces a 'cancerous growth' in the thyroid of rats. The announcement was made at a news conference by Arthur S. Flemming, Secretary of the Department of Health, Education and Welfare. It immediately provoked a flurry of questions about the safety of the nation-wide cranberry crop and brought vigorous assertions from major cranberry producers that dangers to health were virtually non-existent. Amid some resulting confusion these points appeared clear:
>
> * No contamination of berries by the weed-killer, aminotriazole, has been reported from the major cranberry-producing states of Wisconsin, New Jersey and Massachusetts. However, intensive studies are being made of the crops there.
>
> * If housewives are unable to determine where berries were grown, the Government advises them not to buy, either in canned or fresh form, despite the approach of Thanksgiving. (New York Times, 11-10-59:1)

Perhaps not surprisingly, given this warning, sales of cranberries plummeted, despite attempts by pesticide supporters to counter the negative public image, including then-Vice President Richard Nixon eating four helpings of cranberry sauce for the press (Dunlap, 1981; Bosso, 1987).

It is, unfortunately, impossible to determine conclusively what impact this media coverage had on the post-World War II pesticide controversy. It is likely, however, that this coverage played an important role in softening up the public (Kingdon, 1984), acclimating them to the idea that pesticides could have negative as well as positive impacts and thus making them more receptive to the criticisms of pesticides contained in Rachel Carson's Silent Spring. Other authors have argued that pre-Silent Spring popular media coverage of negative impacts associated with two other

"wonders" of modern science, nuclear technology and Thalidomide (Graham, 1970; Lutts, 1985), also contributed to the public's receptivity of Carson's claims.

POLICY BATTLES, 1944-1961

The data presented in the preceding section provides us with an interesting conundrum: of the four federal agencies that were most extensively involved in pesticide research and regulation in the late 1940s through the early 1960s (the USDA, FDA, PHS, and USDI/FWS), the one that has been a consistent supporter of pesticide use -- the USDA -- was the most frequent disseminator of negative or cautious claims about DDT in the New York Times during the pesticide's early years of widespread use. In contrast, the two agencies who have historically been much more critical of pesticides, the FDA and the USDI/FWS, appeared only infrequently as disseminators of negative claims. We have already presented the basic elements for a likely accounting of the USDA's action: first, that part of the pesticide-research activity of scientists in the USDA, SAES, and the land grant colleges was to identify possible detrimental impacts of pesticide use, and second, because for these scientists identification of such impacts was to be taken within the broader context of "safe and cautious use" of pesticides they would not have perceived public dissemination of these concerns as in any way challenging pesticide use. As we suggested in the previous section, the fact that such dissemination (at least through

the New York Times) ceased as opposition to DDT mounted was probably not coincidental.

That the FDA and the USDI/FWS did not appear frequently among claimsmakers disseminating negative claims about DDT in the New York Times over the time period 1945-1961 is most likely attributed to the general preference of government bureaucrats to work out of the public limelight (Kingdon, 1984). The paucity of their appearance in the New York Times, however, hardly means these agencies were inactive during this time period. In this section I overview the policy changes the FDA and USDI/FWS sought to address the health and environmental impacts of the synthetics such as DDT that were revealed through these agencies' institutionalized monitoring mechanisms.

In overviewing these actions I have two goals in mind. First, I use the institutionalist perspective to advance the contention made previously in Chapters One and Two of this dissertation: that environmental controversies may provide government agencies with opportunities to advance their interests and goals. Second, I begin an argument that is continued in the following Chapter's section entitled "The President's Science Advisory Committee Report", namely, that the actions undertaken by these agencies during this time period shaped in important ways much more publicly-visible elements of the controversy in the years immediately following the publication of Silent Spring.

Health

Hoberg informs us that:

> [t]he second component of the institutionalist view, the *state as officials in action*, looks at the interests and activities of government officials in the creation and implementation of public policies. According to this version, government officials have their own preferences and the capacity to embody them in public policy. (Hoberg, 1992:10)

In the present case, FDA officials were seeking to expand bureaucratic authority over pesticide regulation, and concomitantly reduce the authority of the USDA (Bosso, 1987).

Disputes between the USDA and the FDA revolved around the extent of governmental regulatory and enforcement action deemed necessary to ensure a safe and wholesome food supply, with the FDA generally supporting much more stringent regulatory and enforcement standards than the USDA (Whorton, 1974). USDA opposition to tougher standards was seen to lie in their role as patrons to farmers, with tougher standards claimed to be both threatening the profitability of agricultural enterprises and as being unnecessary to protect the safety of the food supply (Bosso, 1987). Battles between bureaucrats supporting these two different policy positions (as well as other members of this policy arena such as consumer organizations and farm organizations) had been raging a good four decades prior to the publication of Silent Spring.

Initially these battles were intra-agency, since enforcement of the first piece of food-safety legislation, the Pure Food and Drug Act of 1906, was vested in the USDA's

Bureau of Chemistry (Whorton, 1974). While this placement did not originally alarm pure food advocates (the "father" of the PFDA, Harvey Wiley, was the head of the Bureau of Chemistry at this time), by the 1920s consumer advocates and some members of the health community increasingly regarded the lack of vigorous implementation of the PFDA as due to conflicts of interests within the Bureau of Chemistry (Whorton, 1974). With respect to pesticides, such conflict was seen as rooted in the fact that the Bureau of Chemistry also undertook research designed to facilitate farmers' use of pesticides. In part as a response to these criticisms, enforcement of the PFDA was vested in 1927 in the newly-created Food, Drug and Insecticide Administration (subsequently the Food and Drug Administration), which did not have any competing regulatory assignments (Blodgett, 1974). The FDA remained housed within the USDA until 1940, when the Roosevelt Administration relocated it to the newly-created Federal Security Agency (Whorton, 1974; Bosso, 1987). In 1953 the agency was moved to Health, Education, and Welfare (HEW) (Blodgett, 1974).

Efforts to expand FDA's influence over pesticide regulation were hardly abated by the widespread adoption of synthetic organic pesticides. One early effort occurred with respect to passage of the 1947 Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). FIFRA was essentially a labelling or truth in advertising law, requiring pesticide manufacturers to register product labels with the USDA, and to

acquire pre-market clearance of those labels (Bosso, 1987). It was a law written by and for pesticide manufacturers and users and their governmental supporters, and as such made no pretense to address health concerns. Such concerns were, however, raised in House Appropriations Committee hearings on the bill by Rep. Frank Keefe, a Republican from Wisconsin. An advocate of pure food legislation, Keefe was the only member of the Committee to question why authority over FIFRA should be granted to the USDA rather than the FDA (Bosso, 1987).

While Keefe did not pursue this issue at the time (and authority for FIFRA was vested in the USDA), he did make attempts in the following years to interest other colleagues in the issue of potential health impacts of pesticide residues. Initially these efforts met with little success, though this situation began to change after Keefe approached Rep. James V. Delaney, a Democrat from New York and a member of the House Rules Committee (Bosso, 1987). The issue was subsequently broached with House Speaker Sam Rayburn, and in May, 1950, a special panel to investigate these concerns, the House Select Committee to Investigate the Use of Chemicals in Food, headed by Delaney, was formed (Blodgett, 1974; Dunlap, 1981; Bosso, 1987).

> The Delaney Committee, as the panel came to be known, was granted a broad authority to investigate the use of chemicals in food production, their effects on health, and their centrality to the stability and well-being of the farm economy. (Bosso, 1987:73)

At this time, the FDA's regulatory activity with respect

to pesticides was the setting of tolerance levels for pesticide residues on raw agricultural products shipped in interstate commerce, as specified under the 1938 Food, Drug and Cosmetic Act (FDCA). At the Delaney hearings, FDA officials testified that their ability to protect the public from pesticide residues was hampered by the fact that the FDCA did not allow the agency to set tolerance levels for a pesticide until after it was on the market. Indeed, under the provisions of FDCA the FDA could only promulgate formal tolerance levels following a long series of public hearings (Dunlap, 1981:64, 267). We see the FDA's dissatisfaction with this state of affairs reflected in the following testimony by Dr. Paul B. Dunbar, Commissioner of the Food and Drug Administration:

> One of the disturbing things about the recent advance in insecticides, in the discovery of new insecticides, has been that a great many very potent and valuable insecticides have been developed on which very little is known, either about their chronic or acute toxicity or about their fate after they are applied to food. In many cases we do not know whether the insecticide after application is absorbed into the body of food, whether it is destroyed on weathering, whether it degenerates, perhaps into some more toxic substance. There were even insecticides put out for which no chemical methods of identification or analysis is known.
>
> The tolerance making authority is good as far as it goes, but it does not prevent the premature use of insecticides before their safety has been determined. (U.S. Congress, 1951a:34)

A similar assessment is made by C.W. Crawford, Deputy Commissioner of Food and Drugs, Food and Drug Administration:

> I have tried to make clear in my statement on the food and drug law that, in our judgement, it is not effective in dealing with insecticides and fungicides that have not

> been adequately tested to show just how poisonous they are and how much of them can be tolerated... I have prepared a draft of what in the judgement of the Food and Drug Administration would represent a desirable amendment to the food and drug law... [It] would require pretesting of an article to determine, first of all, whether or not it is poisonous, and if it is, just how poisonous it is, before it is permitted to be placed on the market. (U.S. Congress, 1951a:341, 345)

In 1954, the FDCA was amended according to the FDA's recommendations (Whorton, 1974; Dunlap, 1981). What is not made clear in these two quotations is that the Miller Amendments would also allow a bit of FDA encroachment on the USDA's traditional regulatory turf. Because the Miller Amendments required that tolerance levels be set prior to product marketing, this meant that the USDA could only register a pesticide for those uses that would not exceed the FDA's tolerance level (Blodgett, 1974). "Further, the FDA's judgement that a pesticide was unsafe for <u>any</u> use on or near food meant its total ban for food-related purposes" (Bosso, 1987:77).

The Environment

The USDI's beef with the USDA was similar to that of the FDA's, except their focus, of course, was on more stringent regulation and enforcement to protect the environment from pesticide-related harms. I have previously discussed the reasons for the USDI's later entry into the pesticide policy arena; it is only in the latter half of the 1950s that we start to see efforts to grant the USDI greater involvement in pesticide policy. Much of the USDI's initial focus was on

securing increased funding for research on the impacts of pesticides on wildlife. The annual funding for pesticide research at the FWS's Patuxent Wildlife Research Center in the mid-1950s, for example, was $52,000 (Graham, 1970: 42). In 1956, a bill to increase this funding was referred to the House Committee on Merchant Marine and Fisheries Subcommittee on Fisheries and Wildlife Conservation (Bosso, 1987). The 1958 version of this bill (S. 2447) was designed to:

> authorize and direct the Secretary of the Interior to undertake continuing studies of the effects of insecticides, herbicides and fungicides upon fish and wildlife for the purpose of preventing losses of these invaluable natural resources following spraying and to provide basic data on the various chemical controls so that forests, croplands, and marshes can be sprayed with minimum loss of fish and wildlife. (U.S. Congress, 1958:i)

Initially, this bill languished in the Subcommittee. In 1957, as a result of mounting concerns over the gypsy moth and fire ant campaigns, USDI officials turned to Warren Magnuson, a Democrat from Washington and the chair of the Senate Committee on Interstate and Foreign Commerce, to sponsor the bill. Magnuson held hearings on the bill in 1958 (Bosso, 1987). USDI's argument for the need for the funding increase is presented in the following testimony given at these hearings by Lansing A. Parker, Assistant Director for the Wildlife Bureau of Sports Fisheries and Wildlife, Fish and Wildlife Service:

> ...the Bureau has received a great many...inquiries from conservation organizations and individuals concerning effects of pesticidal compounds on the Nation's wildlife resources. It has also received numerous communications

> from the Department of Agriculture and other Federal as well as state agencies soliciting advice as to ways and means by which the harmful effects of pesticides can be minimized. At the present time fish and wildlife technicians do not have the answers to many of the questions that are being asked. They do not possess adequate laboratory and field data to evaluate properly some of the pesticidal formulations now in use, and they have little or no data on other compounds that will appear on the market during the coming months. In short, scientific knowledge in the realm of pesticides is 5 to 10 years behind the discovery, formulation, and field application of these compounds. (U.S. Congress, 1958:9-10)

Congress passed the Pesticide Research Act (P.L. 85-582) in 1958, providing the USDI with a maximum annual funding cap of $280,000 to conduct research on environmental impacts of pesticides (Blodgett, 1974). A bill seeking to raise the funding ceiling to $2,565,000 annually was introduced in the Senate Subcommittee on Merchant Marine and Fisheries the following year (Blodgett, 1974). Once again, Lansing Parker testified at the Subcommittee hearing in defense of this second funding increase:

> In view of the critical nature of the problem it is now apparent that the $280,000 ceiling on investigation in this field is entirely inadequate. S. 1575 proposes to raise the authorization to $2,565,000. We recommend that the bill be amended to eliminate any fixed amount as the authorized ceiling. We believe the logical approach to financing the studies of the effects of pesticides on fish and wildlife is through preparation of budget submissions developed in accordance with the needs of a sound, well-planned research program. (U.S. Congress, 1959:78)

The annual limit was raised by Congress in 1959 to the requested $2,565,000. While this legislation did not in itself change USDI's regulatory position vis-a-vis the USDA, it did serve to bolster the evidential foundation on which

subsequent USDI attacks were launched. A direct attack on the USDA's near monopoly on pesticide regulation is found in the Pesticides Coordination Act, introduced into Congress in 1958, 1960, and 1961 (Blodgett, 1974; Bosso, 1987). As spelled out in the 1960 bill (H.R. 11502), this act would:

> provide for advance[d] consultation with the Fish and Wildlife Service and with state wildlife agencies before the beginning of any Federal program involving the use of pesticides or other chemicals designed for mass biological controls. (U.S. Congress, 1960:i)

A more detailed description of the provisions of this act is provided in the following testimony by Daniel H. Janzen, Director of the Bureau of Sport Fisheries and Wildlife, Fish and Wildlife Service, before the House Subcommittee on Merchant Marine and Fisheries:

> Now, turning to the provisions of H.R. 11502, the major features are that any Federal official or agency must consult with the Fish and Wildlife Service and the State fish and wildlife agency before initiating or providing financial or other assistance for any control program using chemical pesticides; that information concerning the program is to be furnished to Fish and Wildlife Service before this consultation; that the Fish and Wildlife Service shall advise of the wildlife damages that may occur from the proposed programs and cooperate to devise control methods that minimize the undesirable effects on wildlife; that if the officer or agency fails to take actions recommended by the Fish and Wildlife Service, the Service shall immediately report to the Congress. (U.S. Congress, 1960:52-53)

This act reflected conservationists' anger over environmental destruction following the USDA's gypsy moth and fire ant campaigns and the inability of the USDI to halt these spray campaigns. In contrast to the Pesticide Research Act, however, this bill was not proposed by the USDI and the

agency's support of it was at best luke-warm. The major expression of concern of the USDI was that its scientific knowledge of wildlife and environmental impacts of pesticide use at this time was not sufficient to allow for the kind of oversight of pest control programs the bill mandated. At the same time, there is indication that the USDI was hardly opposed to the general idea of increased involvement in pesticide regulation. We see this in the following exchange between Rep. Zincke and Bureau of Sport Fisheries and Wildlife Director Janzen at the Subcommittee Hearings. In this exchange, Zincke is trying to determine just exactly what is the source of USDI opposition to the proposed Pesticide Coordination Act:

> **Mr. Zincke.** There is certainly no objection to having another agency furnish you information concerning a [pest control] program, is there?
> **Mr. Janzen.** No; that is correct. That is the part we would recommend. Yes, sir.
> **Mr. Zincke.** There is no objection to the fact that the Fish and Wildlife Service is to advise of the wildlife damages that may occur from the program?
> **Mr. Janzen.** Within its ability, that is right.
> **Mr. Zincke.** And that, if you have any information with respect to controlling such dangers, there is no reason why you should not give that to the other agency, is there?
> **Mr. Janzen.** No; that is correct, sir.
> **Mr. Zincke.** Is there any particular objection to the provision that, if the agency fails to take actions that you suggest, that the Service reports that fact to Congress?... There is no objection to notifying Congress of the fact that they are going ahead with a program that might prove detrimental to wildlife, is there?
> **Mr. Janzen.** I expect that I would answer that, as far as I am personally concerned, there is not, sir.
> ....
> **Mr. Zincke.** ... Now, would there be any objection when an inquiry is made of you by another agency to your saying "We do not know what the effect is and therefore we

cannot comment on your program"?
Mr. Janzen. That would have to be our answer, sir.
Mr. Zincke. There is nothing administratively impractical in that, is there? It may be a little embarrassing to admit that you do not know but there is nothing administratively impractical about it, is there?
Mr. Janzen. I think if that is thoroughly understood that we would not be in a position to furnish the type of information that would be expected under this bill, then I think you are right.
Mr. Zincke. It is not reasonable to assume that in the course of time, more or less depending on your activity, that you would be in a position to furnish this information?
Mr. Janzen. That is what we hope, exactly, sir.
(U.S. Congress, House of Representatives, Subcommittee on Fisheries and Wildlife Conservation of the Committee on Merchant Marine and Fisheries, 1960:54-55)

Congress failed to pass the Pesticide Coordination Act in 1960, and Rep. John Dingell reintroduced the bill in 1961. He subsequently withdrew the bill, however, following a request from the Kennedy Administration that the involved agencies be given a chance to work out an administrative response to the problem of interagency cooperation (Bosso, 1987). The result of these actions was the establishment in 1961 of the Federal Pest Control Review Board (FPCRB). The FPCRB was an interagency committee composed of representatives from all federal departments involved in pesticide research, regulation, or use, including the USDA, the USDI, HEW, and the Department of Defense (Blodgett, 1974:212-213). The FPCRB was designed as a formal mechanism through which these agencies could exchange information on federal-sponsored pest control programs. Other federal pesticide activities, such as research and registration, did not fall under the purview of this agency. Furthermore, the FPCRB was purely advisory in

nature, so that even if the FWS raised objections to a USDA-sponsored treatment program they had no jurisdictional ability to stop the program (Bosso, 1987). It was the advisory nature of the FPCRB that led the USDA to push for that solution over the Pesticide Coordination Act, which would have legislatively mandated a role for the USDI in federal pest control programs.

CHAPTER FIVE

CASE STUDY, PART II: 1962-1969

In this chapter I continue my case study analysis, reporting on the time period including and immediately following the publication of Rachel Carson's Silent Spring (1962-1969). In most of the chapter I focus on the two-and-a-half years (mid-1962 through 1964) of intense media and government scrutiny following publication of Silent Spring. I begin with a brief discussion of Carson's work and the impact it had on the post-World War II pesticide controversy. Next, I illustrate how, during the time period mid-1962-1964, the New York Times constructed the federal government as the primary arena within which responses to the claims and concerns raised by Carson were to occur. I follow this with an in-depth discussion of the major types of responses undertaken by the federal government and how these were portrayed in the New York Times. In the final section of the chapter I provide a brief overview of events and media coverage occurring in the remainder of that decade (1965-1969).

THE CARSONIAN WATERSHED

In three consecutive weeks in June, 1963 the New Yorker magazine published lengthy excerpts from Rachel Carson's forthcoming book Silent Spring (Carson, 1962b, 1962c, 1962d). The book-length version of that manuscript was published in late September, 1962. Silent Spring was offered as a selection in the "Book of the Month Club" in October, 1962, and quickly became a national bestseller (Graham, 1970).

In Silent Spring Carson for the first time assembled the various threads of evidence that underlay the mounting health and environmental concerns about widespread use of the synthetic organic pesticides and presented these in a language and style accessible to the lay public (Graham, 1970). There were few at this time as well positioned to accomplish this task as Ms. Carson. The author of two previous bestsellers (The Sea Around Us, published in 1951 and The Edge of the Sea, published in 1955), she was already well-respected both for her keen insights into the natural world and the literary grace with which she conveyed these insights to her readers.

The impact of Carson's book on both this pesticide controversy and the broader American environmental movement were profound:[7]

The landmark book Silent Spring played a vitally

---

[7] An important technological innovation, the development of the gas chromatogapher, also happened in 1962. This instrument allowed scientists to measure much more minute quantities of pesticide residues than they had been able to do in the past.

> important role in stimulating the contemporary environmental movement... Silent Spring has been compared in its social impact to Uncle Tom's Cabin; John Kenneth Galbraith described it as one of the most important books of Western literature and Robert Downs listed it as one of the 'books that changed America'. (Lutts, 1985:211)

The influence of Carson's work was further expanded by extensive dissemination of her claims and concerns about pesticides through other media sources (Bosso, 1987). Figure 1 (Chapter Four) charts the increased coverage of pesticides in the three major newsweeklies and the Readers' Digest following publication of Silent Spring. Another major national news media source, the New York Times, published 142 pesticide-related articles between July, 1962 (the month following the publication of excerpts from Silent Spring in the New Yorker) and December, 1964.

Table 6 provides a quantitative assessment of the extent to which New York Times coverage of pesticides in the two-and-a-half years of intense controversy that occurred following the publication of Silent Spring were supportive or critical of Carson's claims. This table utilizes a strategy developed in other research on agenda setting and hazardous technologies (Weart, 1988; Baumgartner and Jones, 1993) of classifying magazine and newspaper headlines according to whether they portray positive, negative, or neutral images of the technology in question. In constructing this table, I followed the guideline recommended by Baumgartner and Jones (1993:51) of asking for each headline, "if ...[I was] an industry leader, would ... [I] be pleased or unhappy to see

Table 6. Distribution of **New York Times'** Articles by Headline Theme for All Articles and for Articles with a Federal Government Claimsmaker in the Headline, mid-1962--1964

Theme	All Articles N	All Articles %	Federal Claimsmaker N	Federal Claimsmaker %
Supportive of Carson	97	68.3	37	80.4
Supportive of Pesticide Defenders	19	13.3	6	13.0
Neutral	26	18.3	3	6.5
TOTAL	142	99.9	46	99.9

such a title?"

Headlines supportive of Carson (in other words, headlines that would not please industry leaders) were of three basic types. First were ones that directly alluded to Carson's work, such as the July 2, 1962 editorial **"Rachel Carson's Warning"** (p. 28:2) and the New York Times Book Review entitled, **"There's Poison All Around Us Now: The Dangers in the Use of Pesticides are Vividly Portrayed by Rachel Carson"** (9-23-62:VII, pg. 1). Second were findings from other sources supportive of Rachel Carson's claims, such as the article entitled **"DDT Detected in Aquatic Life in Both the Atlantic and Pacific"** (11-15-63:21).

Third were actions undertaken by government and other actors to address concerns raised by Carson. Examples of

articles in this latter category include **"State Hearings Due on Pesticide Curbs"** (5-19-63:11), **"Safe Biological Pesticides Found for Killing Leaf-Eating Insects"** (4-12-63), and **"U.S. Health Department Backs Federal Controls on Pesticides"** (4-8-64:23). Only actions that conveyed at least serious treatment, if not acceptance, of Carson's claims were included in this category. Actions that lent themselves to denial of these claims were included in the next category, "negative coverage". Headlines that reported on investigations into pesticide use, such as the headline **"Wildlife Inquiry Slated in Oregon: U.S. to Study Pesticides in the Klamath River Basin"** (5-24-64:50) were also included in this third category. While if industry leaders had to make a choice between coverage that said "Further investigation needed" versus "Scientists have found DDT hazardous" they would no doubt choose the former over the latter, it is also reasonable to assume that their real preference would be to have neither of these forms of media coverage since even the former at least suggests there may be hazards associated with pesticide use.

Examples of headlines that were critical of Carson and her concerns (or that, in other words, would please industry leaders) included **"Rachel Carson Book is Called One-Sided"** (9-14-62:37) and **"Pesticide Deaths Put Below One in a Million"** (11-16-62:10). There were also some headlines that conveyed neutral images about pesticides. The most prevalent of these were ones that offered "balanced treatment" of the debate,

such as the 4-4-63 article headlined **"TV: Controversy Over Pesticide Danger Weighed: 'C.B.S. Reports' Gives Both Sides of the Dispute"** (p. 95). A few headlines presented "information conveyance" of the sort that did not lend ready and obvious support to either supporters or defenders of pesticides. An example of this kind of headline was the April 15, 1964 article announcing: **"Rachel Carson Dies of Cancer: 'Silent Spring' Author was 56"** (pg. 1). Finally, there were a few articles in the neutral category that included some information about pesticides but did so within the context of on article whose headline and text largely focused on another (related) issue, such as in the article **"Drug Suit Fights U.S. Label Rule"** (9-6-63:15).

As can be seen in Table 6, the headlines of New York Times articles on pesticides published between mid-1962 and 1964 were overwhelming supportive of Carson's views. Sixty-eight percent of all articles published during this time period fell into this category, while only thirteen percent of articles were classified as supportive of pesticide defenders. When we look only at the 46 articles that contained a federal official or agency in the title, the percentage of articles supportive of Carson jumps to 80 percent.

Silent Spring thus expanded the level of public attention and conflict surrounding pesticide policy. Indeed, Carson intentionally wrote Silent Spring to accomplish just this goal. Carson knew "her book must persuade as well as inform"

(Graham, 1970:36; emphasis in original), and she designed it to "shock the public into action" (Graham, 1970:63). The central role this book is seen to play in the expansion of the post-World War II pesticide controversy is also attested to by titles of subsequent books on pesticides, such as James Whorton's Before Silent Spring (1974), Frank Graham's Since Silent Spring (1970), and H. Patricia Hynes' The Recurring Silent Spring (1989).

CONSTRUCTING POLICY SOLUTIONS

I have argued in this dissertation that there are two reasons why federal government claimsmakers are particularly well placed to influence the nature, dynamics and outcomes of environmental controversies. The first of these is that, due to the essentially symbiotic relation that exists between the government and the popular news media (Molotch and Lester, 1974; Tuchman, 1978; Gans, 1979; Herman and Chomsky, 1988), federal officials and agencies stand a greater likelihood than other claimsmakers of gaining media dissemination for their claims and actions. Tables 6 and 7 both provide evidence for the pervasive presence of federal claimsmakers in New York Times coverage of pesticides in the time period immediately following the publication of Silent Spring (mid-1962 -- 1964). In Table 6 we see that 46 of the 142 articles published over this time period (or 32 percent) contained a federal official or agency as a claimsmaker in the headline. There were a few articles included in this group that did not have clearly

Table 7. Number and Percent of **New York Times'** Articles on Pesticides in Which Various Newsmakers Appeared, mid-1962--1964

Newsmaker	Number of Articles in Which Newsmaker Appeared	Percent (Base= 142)
Federal Government*	73	51.4
President	5	3.5
PSAC	19	13.4
Congress	32	22.5
USDA	30	21.1
USDI/USFWS	16	11.3
HEW/FDA	12	8.5
USPHS	25	17.6
Supreme Court Justice	1	0.7
NAS/NRC	1	0.7
State Government	28	19.7
Local/County Government	11	7.7
Rachel Carson	49	34.5

(Continued)

* This category includes all articles that contained one or more federal claimsmakers. Since many articles contained more than one federal claimsmaker, the total count for articles with particular kinds of federal claimsmakers exceeds the count for the more general category of "federal claimsmaker". For example, an article covering claims made by both the USDA and a U.S. Senator would be included first in the general category "federal claimsmaker" and again under two additional categories ("USDA" and "Congress").

Table 7. Number and Percent of **New York Times'** Articles on Pesticides in Which Various Newsmakers Appeared, mid-1962--1964 (Continued)

Newsmaker	Number of Articles in Which Newsmaker Appeared	Percent (Base= 142)
Environmental Organizations/ Conservationists	21	14.8
NYT Editor	9	6.3
Letter to the Editor	10	7.0
Local Residents	2	1.4
University Scientists	14	9.9
Scientific Association	3	2.1
Medical	5	3.5
International	7	4.9
Farmers and Agricultural Industries	4	2.8
Chemical Industry	14	9.9
Other	3	2.1

identifiable federal claimsmakers in the headline itself, but the text of the article begins with the heading "Washington" in all-capital letters, providing a quite-visible indication of the article's federal origins. Examples of articles that fall into this latter category include **"Pesticides in Foods Discounted in Study"** with the article heading **WASHINGTON** (New York Times, 11-22-62:2), and **"Cancer Aid Urges Test on Pesticides"** with the article heading **WASHINGTON** (New York Times, 7-24-63:29).[8]

Headlines convey important information about claimsmaking activity. They are the most visible portion of a newspaper's layout, and sometimes are the only part of a story people read. For this reason, analysis of headlines is an important component of studying the agenda process (Weart, 1988; Baumgartner and Jones, 1993). At the same time, however, it is important to realize that headline content can vary from article content. An important reason for this divergence is that the individuals who write headlines are frequently not the same people who write the accompanying story (Hulteng and Nelson, 1971). For this reason, it is important to also analyze the content of newspaper articles. Such an exploration is undertaken in Table 7, where I examine the

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[8] There were five articles coded in this manner; in all cases I double-checked to make sure the article indeed was conveying information about federal claimsmakers. This is important, because not all claimsmakers originating in the nation's capitol are, in fact, representatives of the government. Trade associations, for example, often have their headquarters in Washington.

appearance of various claimsmakers in articles rather than in headlines.

As can be seen in Table 7, 51 percent of the 142 articles published between mid-1962 and 1964 contained claims made by and/or actions undertaken by one or more federal claimsmaker. This frequency of appearance far outweighed that of any other claimsmaker or set of claimsmakers, with Rachel Carson coming in a distance second with appearances in 34.5 percent of articles, and state government an even more distant third with appearances in 20 percent of all articles. Frequency of specific federal claimsmakers is reported below the more general heading.

The second reason why federal officials and agencies are likely to exercise particular influence over environmental controversies is that the majority of solutions proposed to address concerns raised in those controversies typically consist of some type of government response. In the present case, the identification of the federal government as the major arena within which solutions to the pesticide problem were to be formulated and implemented was first set in Carson's work and subsequently extended to the popular news media. A number of secondary sources point to this element of Carson's work. According to Lutts (1985:212), Carson criticized government officials for ".. not taking the steps necessary to control this pollution and protect the public." Lear (1993:23) reports that she "accused the government of

being irresponsible." Blodgett (1974) and Hynes' (1989) work also reflects this theme, as seen in the following two quotations:

> [Carson] was not condemning chemical pesticides out of hand. She was condemning the inadequacies of regulation which permitted chemicals to be widely used without careful testing of their hazards, particularly of chronic health and environmental effects. (Blodgett, 1974:215)

> [Carson] pinned down the loopholes in federal environmental regulation, exposed the manipulation of data to cover up pesticide hazards, and identified conflicts of interest in government regulation of pesticides. (Hynes, 1989:4).

Of course, examples of Carson's criticisms of the inadequacy of existing government regulation may also be taken from Carson's own work. The following quotation, taken from the book-length version of Silent Spring, reveals Carson's negative evaluation of the then-existing procedures whereby the FDA set tolerance levels for pesticide residues on raw agricultural products:

> In setting a tolerance level the Food and Drug Administration reviews tests of the poison on laboratory animals and then establishes a maximum level of contamination that is much less than required to produce symptoms in the test animal. This system, which is supposed to ensure safety, ignores a number of important facts. A laboratory animal, living under controlled and highly artificial conditions, consuming a given amount of a specific chemical, is very different from a human being whose exposures to pesticides are not only multiple but for the most part unknown, unmeasurable, and uncontrollable...
>
> In effect, then, to establish tolerances is to authorize contamination of public food supplies with poisonous chemicals in order that the farmer and the processor may enjoy the benefit of cheaper production -- then to penalize the consumer by taxing him to maintain a policing agency to make certain that he shall not get a lethal dose. But to do the policing job properly would cost money beyond any legislator's courage to

> appropriate, given the present volume and toxicity of agricultural chemicals. (Carson, 1962A:182, 183)

Likewise, the first article on Carson's Silent Spring to appear in the New York Times following the publication of the New Yorker excerpts -- a New York Times' editorial -- exonerated Carson's concern and also identified the federal government as the key arena within which solutions to the pesticide problem should be pursued:

> Rachel Carson...has written a three-part series for the New Yorker that few will read without a chill, no matter how hot the weather. Her subject is the controversial one of our increasing use of chemical poisons in a generally unsuccessful effort to eliminate insect pests and the extent to which we are, in the process, subjecting ourselves to the hazard of slow poison through the pollution of our environment. It is controversial because it involves Government policies and affects an important source of profit for the chemical industry... If her series helps arouse enough public concern to immunize Government agencies against the blandishments of the hucksters and enforces adequate controls, the author will be as deserving of the Nobel Prize as the inventor of DDT. (New York Times, 7-2-62:28)

Table 8 provides a quantitative assessment of the extent to which New York Times' coverage of the post-Silent Spring pesticide controversy constructed the federal government as the primary arena within which responses to the problems raised by Carson were to be pursued. The kinds of actual or proposed solutions presented in these articles included scientific investigations, investigations of government regulatory and other actions related to pesticides, the development and deployment of non-chemical and/or less toxic chemical means of control, stricter government regulation and control (examples of specific government regulatory and policy

Table 8. Percentage of **New York Times'** Articles in Which Various Response Arenas to the Pesticide Problem Were Evoked, Mid-1962--1964

Response Arena	Pre-PSAC Report (Base=41)	Post-PSAC Report (Base=101)	Total (Base= 142)
Federal Government	41.5	60.4	54.9
State Government	29.3	18.8	21.8
County/Local Government	12.2	19.8	10.6
Academia	4.9	2.0	2.8
Private/Voluntary Action	41.5	5.9	16.2

changes are discussed below), and educational campaigns to encourage "proper use" of pesticides. The actors who were either actually undertaking these responses, or else advocated as the individuals or organizations who should undertake proposed responses, fell into five general categories (see Table 8). Four of these response arenas (federal government, state government, county/local government, and academia) included actors located in the public sphere.

There were also some responses that were either being carried out by or being advocated for actors in the private sphere. Most typically these involved appeals for "proper use" of pesticide products, that is, solutions that relied on

"voluntary" rather than government-coerced action. A few articles noted private industry's research on and/or development of biological controls, as in the case of a April 12, 1963 article that identified several U.S. companies that were marketing a new biological (microbial) insecticide (Delvin, 1963). Another example of solutions undertaken in the private (and also the public) sphere is conveyed in the following:

> During the year twenty-eight of the 9,000 California dairies were placed on the suspension list -- seventeen by the State Department of Agriculture and eleven by the milk processors themselves -- because of contaminated milk. (Davies, 1962:44)

Table 8 reports the percentage of articles that contained one or more actual or proposed responses undertaken within these five response arenas. The first column reports these percentages for the 41 articles published between 2 July, 1962 and May 15, 1963 (the date before the release of the President's Science Advisory Committee's Report on pesticides), the second column reports these percentages for the 101 articles published between 16, May, 1963 and the end of 1964, while the last column gives these percentages for all 142 articles published across this time period. Pre- and post-PSAC tabulations are given because, as I explain further in the following section, the PSAC report on pesticides constituted the federal government's definitive statement on the pesticide problem and recommended solutions.

As can be seen in Table 8, the federal government

constituted the most-frequently evoked response arena. Sixty percent of all articles published in the post-PSAC period contained one or more actual actions undertaken by, or proposed responses advocated for, federal officials or agencies. This occurrence rate is three times higher than the next-most frequently evoked response arena in this time period, that of county and local government. As can be seen in the last column of this table, almost fifty-five percent of all articles published in the mid-1962 through 1964 period contained one or more actual actions undertaken by, or proposed responses advocated for, federal officials or agencies. This occurrence rate is two and a half times higher than the next-most frequently evoked response arena in this time period, that of state government. Furthermore, of the 142 articles published over this time period there were 28 that contained no actual or proposed responses. Of the 114 articles that did contain at least one actual or proposed response, 68 percent evoked responses in the federal arena.

It is only in the pre-PSAC period that the federal government has another contender for the spot of premier response arena. As can be seen in Table 8, there were two response arenas that registered coverage rates of 41.5 percent in the articles published over the period mid-1962 through mid-May, 1963: the federal government, and private/voluntary action. Coverage of this second arena dropped substantially in the post-PSAC period, however (to almost 6 percent of

articles), and occurred in only 16 percent of articles published over this entire time period.

Having established that over the time period mid-1962 through 1964 the New York Times constructed the federal government as the primary arena within which responses to the claims and concerns raised by Carson were to occur, I turn now to a more in-depth discussion of what those federal responses were.

THE PRESIDENT'S SCIENCE ADVISORY COMMITTEE (PSAC)

The first Silent Spring excerpt to appear in the New Yorker magazine was published on June 16, 1962 (Carson, 1962b). The first public federal response to Carson's article occurred in late August, 1962, when at a press conference President Kennedy, in response to a reporter's question, gave his reassurances that the federal government was looking into the concerns raised by Carson (New York Times, 8-30-62:10; Graham, 1970). More specific details of exactly how the government was going to "look into" these issues were elaborated in a New York Times' article published on the following day (New York Times, 8-31-62:9). Specifically, that response took the form of an investigation into Carson's claims by a special committee of the President's Science Advisory Committee (Graham, 1970; Blodgett, 1974; Dunlap, 1981; Bosso, 1987). There were three broad tasks that comprised this endeavor. These were: (1) an evaluation of the scientific merit of Carson's claims of harm, (2) an

evaluation of existing government practices and policies regarding pesticides, and (3) recommendations for improving those practices and policies.

I discuss the PSAC's stance on these issues below. First, however, I explore how the PSAC came to be constructed as the definitive governmental and public statement on "the pesticide problem", and the template from which policy solutions to that problem were to be drawn. According to Kingdon (1984), successful placement of an issue on the government agenda is followed by the generation of a range of potential policy responses to that problem. Advocates of various policy responses engage in negotiations and posturing (which, unlike agenda setting, typically occurs out of the public limelight); out of this process there typically emerges a small subset of policy options that involved participants recognize as the ones that at least stand some likelihood of receiving serious consideration.

The President's appointment of the PSAC to examine Carson's claims served an important signal that this Committee was going to constitute one of the major arenas within which potentially viable policy options would be hammered out. The President is the nation's premier agenda setter; as Kingdon (1984) notes, when the president turns his attention to an item agendas are set all over town. President Kennedy also put his stamp of approval on the Committee's report when it was released in May, 1963, directing "the relevant departments

and agencies to implement its recommendations" (Blodgett, 1974:216).

The New York Times also constructed the PSAC report as the definitive statement on pesticide problems and policy options. The paper's coverage of the President's announcement of the PSAC's investigation, and of his endorsement of the final report (Toth, 1962:16) were important elements of this construction, but they do not constitute the whole story. In the eight-month period following the publication of the two articles announcing the PSAC investigation of Carson's claims and the release of that investigation, only three headlines (out of 36 articles published over this time period) contained federal claimsmakers. One of these articles, **"Pesticides study found difficult"** (12-7-62:41) reported on the progress of the PSAC investigation, while the other two, **"Pesticides in foods discounted in study [Washington]"** (11-22-62:2) and **"Health chief doubts need to strengthen pesticides controls [Washington]"** (4-15-63), reflect the more classic conflict avoidance-containment-defusement strategy. Limited visibility of federal actors during this time period conforms to Kingdon's (1984) assertion that specification of policy alternatives typically occurs out of the public limelight.

The PSAC report was released on May 15, 1963 (President's Science Advisory Committee, 1963). On the following day the New York Times published a lengthy, six-column excerpt from the report (New York Times, 5-16-63:28), as well as a second

article overviewing the highlights of the report (Toth, 1963:16). Altogether, the New York Times published nine articles with headlines containing federal claimsmakers during the month of May, 1963. In addition, what were the first and subsequently the most publicly-visible of the Congressional committee and sub-committee hearings held on pesticides during this time, those of the Senate Committee on Government Operations' Subcommittee on Reorganization and International Organizations, chaired by Abraham Ribicoff (and henceforth referred to as the Ribicoff hearings), convened on the day following the release of the PSAC report. The first witness to testify at these hearings was Dr. Jerome B. Wiesner, head of the PSAC (New York Times, 5-17-63:13). All of these activities conveyed the message that the government had been waiting to act until it received the PSAC's evaluations and recommendations.

In addition, the PSAC report was periodically evoked in articles published over the remainder of 1963 and 1964. In some cases these evocations informed readers that various recommendations of the PSAC were being diligently pursued; others raised criticisms of inadequate response. The following New York Times editorial provides an example of both of these forms of evocation:

> Almost a year ago a report by the President's Science Advisory Committee warned of the dangerous potential of pesticide poisoning of man and wildlife.... Some of the report's recommendations for tighter controls have been carried out; but in light of the mass slaughter of Mississippi fish [attributed to the chlorinated

> hydrocarbons aldrin and dieldrin] it seems clear that the remedial measures are still most inadequate. (New York Times, 3-29-64:IV,8)

With respect to content, the PSAC report in some respects vindicated Carson. This vindication occurred through the Committee's recognition that pesticide use could pose unintended and harmful side effects, and that insufficient scientific investigation had been undertaken into the nature and extent of these side effects. The Committee also called for more cautious approaches to pesticide use. On the other hand, unlike Carson, the Committee also balanced these criticisms with a discussion of the benefits of pesticides.

The Committee's coverage of both cost and benefits of pesticides left it open to divergent evaluations. Dunlap (1981:115), for example, regards the reports vindication of Carson as quite minimal, arguing that the Committee's report "did not endorse many of Carson's charges." Bosso (1987), on the other hand, views the report as more damaging to industry's interest than Silent Spring. This threat stemmed from the twin facts that PSAC members were both imminently respected scientists and government insiders, and therefore could not be so easily dismissed as Carson. The New York Times, for its part, chose to highlight the elements of the report that vindicated Carson, as seen in the headline of the article that accompanied the release of the PSAC, **"Scientists Urge Wider Controls Over Pesticides: President's Panel Calls for Stiffer Rules to Protect the Health of the Nation"** (Toth,

1963:16), and the headline of the article published the following day: **"Pesticide Danger May Exceed That of Fallout, Weisner Says: President's Advisor Calls for Wide Study and Creation of a Center for Testing"** (New York Times, 5-17-63:13).

The PSAC also identified various shortcomings in federal pesticide policy, and made various recommendations about how to correct these shortcomings. At a general level:

> the Panel's recommendations are directed to: an assessment of the levels of pesticides in man and his environment; to measures which will augment the safety of present practices; to needed research and the development of safer and more specific methods of pest control; to suggested amendments or public laws governing the use of pesticides; and to public education. (New York Times, 5-16-63:28)

Many of the specific recommendations (which I discuss in more detail below) incorporated the two major lines of changes pursued in the pre-Silent Spring era: increased research activities and monies for the FDA and the USDI/FWS, and increased authority of these two agencies (particularly the USDI) over pesticide registration and regulation. This finding conforms to Kindgon's (1984) model of the agenda setting/alternative specification process. Due to the brief time that items maintain high agenda status, and the fact that the kinds of events that frequently move items to high agenda status are difficult to anticipate and plan for, claimsmakers that do not have solution options already prepared and softened up when these opportunities present themselves are not likely to get any serious consideration for their ideas.

The FDA and the USDI were advantaged in the alternative specification process not only by the fact that, due to their activities in the 1950s and early 1960s they went into the post-Silent Spring portion of the controversy with policy options already prepared and softened up, but also by the fact that, as federal bureaucracies, they constituted quintessential government insiders. The privileged access to policy negotiations such insider status generally affords government bureaucrats (Kingdon, 1984) was further reinforced in this case by the focus of the PSAC investigation on "the effectiveness of Government programs dealing with the use and control of pesticides" (Hunter, 1963:9)

At the same time, it should be pointed out that the USDI took a more aggressive stance in promoting policy changes in the post-Silent Spring era than the FDA. Amendments to the Food, Drug and Cosmetic Act passed in 1954 and 1958 had increased the FDA's regulatory authority to set tolerance levels for pesticide residues in raw agricultural products; agency officials largely regarded these regulatory tools as adequate to protect consumers. What the FDA did push for was more research into chronic impacts of pesticide exposure (Dunlap, 1981:120).

The situation of the USDI at this time was different; the only in-roads it had made into the pesticide policy arena was its purely advisory role on the Federal Pest Control Review Board. The USDI, therefore, not only advocated increased

research into the environmental impacts of pesticide use but also increased involvement in pesticide registration and regulation, that is, bureaucratic encroachment on the USDA's turf (Bosso, 1987). The FDA provided general support for the USDI in this endeavor, as reflected in the statement made by HEW Secretary Celebrezze at the 1963 Ribicoff hearings that the primary threat of pesticides at the time was not residues in food products but whether "continued use would contaminate the environment to such an extent that it would, ultimately, threaten both man and the environment" (cited in Dunlap, 1981:121).

Below I discuss the major policy options pursued over this time period and the way in which these options were portrayed in the New York Times. Before I turn to this task, however, I first present a more general analysis of the role of government agencies and officials in this controversy.

ENVIRONMENTAL CONTROVERSIES AND THE STATE

In the preceding two sections I presented evidence of the pervasive influence of federal claims and actions in New York Times coverage of the post-Silent Spring pesticide controversy (mid-1962-1964). In this and the following four sections I turn my attention to an in-depth analysis of the nature of that influence. In Chapter Three I discussed literature that suggests that the typical state response to environmental controversies and crises will be one of conflict avoidance, containment, and defusement (Schnaiberg, 1980; Edelstein,

1988; Jasper, 1988; Clarke, 1989; Bogard, 1989; Reich, 1991; Lorenz, 1993; Schnaiberg and Gould, 1994). In that chapter I also used the institutionalist perspective of the state (Skocpol, 1985; Campbell, 1985; Hoberg, 1992) to present a counter position, arguing that in some cases environmental crises and controversies may present government agencies and officials opportunities to pursue organizational, career, and personal goals. In these circumstances we would expect to find (at least in the short-term) some government agencies and officials acting to take advantage of the opportunities presented by the crises or controversy, with these actions contributing (either purposefully or inadvertently) to the perpetuation or perhaps even escalation of the conflict.

The findings reported in Table 6 indicate that the dominant theme of the publicly-visible government response was hardly one of conflict avoidance, containment, or defusement. As can be seen in this Table 6, 80 percent of the 46 articles published between mid-1962 and 1964 that contained a federal claimsmaker in the headline presented claims or actions that were supportive of Carson's work.[9] The federal official who undertook the most extensive efforts to maintain high public visibility of the pesticide issue was Senator Abraham Ribicoff

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[9] In their analysis of pesticide-related articles indexed in the Reader's Guide to Periodical Literature between the years 1900 and 1987 Baumgartner and Jones (1993) also found that just over 80 percent of all article titles that reported on government claims and/or actions conveyed a negative assessment of pesticides or present pesticide practices.

(D., Conn.). A former Secretary of Health, Education, and Welfare (Bosso, 1987), Ribicoff chaired the most extensive and publicly-visible Congressional hearings on pesticides in the post-Silent Spring era, those undertaken by the Senate Committee on Government Operations' Subcommittee on Reorganization and International Organizations (the Ribicoff hearings). Ribicoff timed the start of the Subcommittee's 1963 hearings to take advantage of two "media events": the May 15 release of the President's Science Advisory Committee's Report on pesticides, and the April 3 airing of the hour-long "C.B.S. Reports: The Silent Spring of Rachel Carson" (Gould, 1963:95).

The 1963 Ribicoff hearings received an impressive amount of New York Times coverage in the summer and fall of 1963, with eleven articles on the hearings published between 5 May, 1963 and the 21 August, 1963. Another eight articles on the Ribicoff hearings were published during the first half of 1962.[10] As a point of contrast, New York Times coverage of other Congressional committee and subcommittee hearings occurring over this time period included two articles

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[10] One reason New York Times' coverage of the Ribicoff hearings may have been so substantial was because Senator Ribicoff was from Connecticut, a state close enough to New York to form a viable market for the newspaper. In other words, given the proximity of Connecticut to New York the former state likely contained a fair number of residents interested in keeping up with events in the latter state (particularly the various cultural and financial developments in New York City); New York Times' coverage of events from their own home state would just make the paper that much more attractive to these Connecticut residents.

reporting on hearings held by the House Committee on Merchant Marine and Fisheries, one article reporting on hearings held by the Senate Appropriations Committee, one article reporting on hearings held by the Senate Committee on Commerce, one article reporting on hearings by the House Agriculture Committee, and two articles reporting on hearings by the Senate Agriculture Committee.

The early appearance of Rachel Carson as a witness at the Ribicoff hearings generated further publicity. Carson's impending testimony to the Ribicoff committee was announced in a May 18, 1963 New York Times article headlined **"Miss Carson to Testify"** (p. 29), published not quite two weeks after the Committee hearings first convened. Carson's subsequent testimony at the hearings was portrayed in the following headlines: **"Pesticide Peril Charged to U.S.: Rachel Carson Joins Javits in Attack on Westchester and Rockland Spraying"** (Toth, 1963:43); **"Critic of Pesticides: Rachel Louise Carson"** (New York Times, 6-5-63:83), and **"Miss Carson Describes Rise in Chemical Poison: Tells Senate Committee Low Concentrations Gain as They Pass Through Food Chains"** (New York Times, 6-7-63:38). Ribicoff reconvened the committee hearings in mid-February, 1964 following widespread publicity of the Public Health Service's attribution of massive fish deaths in the lower Mississippi River to two chlorinated hydrocarbon pesticides, aldrin and dieldrin (Finney, 1964:32).

At the same time, seeking to advance organizational,

career and personal goals through publicly visible actions is not without risk. For example, government officials who actively promote the labelling of some condition as a "social problem" are under particular pressure to produce some kind of solution to that problem. Failure to produce such a solution can call into question the efficacy of particular officials and agencies as well as pose broader legitimacy threats. I explore the applicability of these arguments to Senator Ribicoff's actions in the section entitled "Ending Protest Registration."

To interpret the actions of government agencies and officials during the course of environmental controversies, therefore, we must understand the fine dance they perform as they seek to take advantage of opportunities while avoiding risks. For example, one strategy that could be pursued by an agency to gain increased resources is to claim existing resources are not sufficient to allow adequate government response to the problem. We see one FDA official pursuing this strategy shortly after publication of the New Yorker excerpts of Silent Spring:

> ...the Food and Drug Administration...establishes the maximum permissible limits of contamination that will be allowed on food shipped in interstate commerce. These limits are called tolerances. One regulation excludes any pesticide residues in milk and milk products. However, because the agency has so few inspectors, this regulation has reportedly been violated numerous times. (Hunter, 1963:9)

The dangers inherit in using this strategy are revealed in the last sentence of this quotation, which is tantamount to

a confession that public health and safety was being jeopardized. Such a confession not only called into question the legitimacy of the FDA itself but could also incite public panic, a fate government agencies typically try to avoid at all costs (Edelstein, 1988). Given this, it is probably not surprising that the FDA maintained a low public profile in the years immediately following the publication of Silent Spring, appearing, for example, in less than nine percent of all New York Times articles published over this time period (see Table 7). Furthermore, the message most typically sent by the FDA in these appearances was one of reassurance, as in the following quotation from a New York Times article headlined **"Pesticides in Foods Discounted in Study"**:

> American housewives were assured by the Government today that this nation's food supply 'is both safe and nutritious'. The Food and Drug Administration made the comment in reporting on diet studies in which its scientists analyzed market-basket samples of food for pesticides residues and vitamin content. 'Pesticide residue content was found well within safe tolerance limits set for specific pesticides on individual foods,' the agency said. (New York Times, 11-22-62:2)

Recognizing the fine line FDA officials must tread in their efforts to secure whatever advantages they might from the opportunities created by the Silent Spring-inflamed controversy while minimizing negative fall-out sheds light on the schizoid evaluations given of FDA's actions in the post-Silent Spring years. In some accounts, the FDA is portrayed as a recalcitrant and obstructionist agency. A New York Times article announcing the impending release of the President's

Science Advisory Committee report, for example, informs readers that publication of the report has been delayed due to efforts by the USDA and the FDA to "tone down" the critical position taken by the Committee (New York Times, 5-5-63:76). This recalcitrance is also conveyed in the following quotation from the New York Times pertaining to the department in which FDA is housed, that of Health, Education and Welfare:

> The Department of Health, Education and Welfare told Congress today that the Mississippi River fish deaths demonstrated the need for Federal action to restrict the use of dangerous pesticides... For nearly a year the department has avoided taking a stand on the issue, officials said. Until recently, its various sections did not place much emphasis upon the contamination problem presented by pesticides. (New York Times, 4-8-64:23)

Blodgett's (1974) evaluation of the FDA presents us with a very different image of the agency, however. He maintains that "the FDA, in general, responded positively to the PSAC report and moved to upgrade its procedures" (Blodgett, 1974:223).

In the following three sections I turn my attention to an in-depth presentation of the three major categories of responses undertaken by federal agencies and officials in the aftermath of Silent Spring: investigations, interagency relations, and the ending of protest registration. For the first two of these categories I cite the particular PSAC recommendations, as they were disseminated through the New York Times' excerpt from that report, that supported the need for these actions. The New York Times' excerpt did not report

on the PSAC recommendation pertaining to protest registration. I also indicate the ways in which various actions taken within each of these response categories promoted the interests of particular agencies and officials.

The findings reported in these sections also support my contention that, while some government agencies and officials may seek to take advantage of opportunities created by environmental controversies and conflicts in the short-term, the longer-term pressure is to generate some type of publicly-visible resolution to the controversy. In the five month time period spanning mid-May, 1964 through mid-October, 1964, resolutions in all three of these response categories were reported in the New York Times. In two of these response categories, the involvement of President Johnson in promoting the proferred resolution helped to heighten their public visibility. By 1965, the pesticide issue had dropped to a fairly peripheral position on the government and public agenda (see Figure 1). In the final section of this chapter I argue these findings provide support for Jasper's (1988) argument that government action plays an important role in depoliticizing technological controversies.

INVESTIGATIONS

Both the FDA and the USDI continued their push for increased research into the potential unintentional side effects of pesticides on nontarget organisms in the aftermath of Silent Spring. This theme was continued in the PSAC's

recommendations for addressing the pesticide problem:

> In order to determine current pesticide levels and their trends in man and his environment, it is recommended that the Department of Health, Education and Welfare:
>
> * Develop a comprehensive data gathering program so that the levels of pesticides can be determined in occupational workers, in individuals known to have been repeatedly exposed, and in a sample of the general population...
>
> * Cooperate with other departments to develop a continuing network to monitor residue levels in air, water, soil, man, wildlife, and fish. The total diet studies on chlorinated hydrocarbons initiated by the FDA should be expanded...
>
> * The FDA proceed as rapidly as possible with its current review of residue tolerances, and the experimental studies on which they are base[d]. When this review is completed, it is recommended that the Secretary of Health, Education and Welfare select a panel from nominations by the National Academy of Sciences to revalue toxicological data on presently used pesticides to determine which, if any, current residue tolerances should be altered. Of the commonly used chemicals attention should be directed first to heptachlor, methoxychlor, dieldrin, aldrin, chlordane, lindane, and parathion because their tolerances were originally based upon data which are in particular need of review. (New York Times, 5-16-63:28)

The New York Times also reported on a welter of federal investigations into pesticide problems, policies, and practices undertaken by Congressional Committees and Subcommittees, government agencies, and the President's Science Advisory Committee. Altogether, 51 of the 142 pesticide-related articles published in the New York Times between mid-1962 and 1964 (or 36 percent) contained information on at least one federal pesticide investigation. Examples of how this investigative activity was portrayed in headlines is provided in Table 9.

There are three ways in which investigations may advance

Table 9. Examples of **New York Times'** Headlines Portraying Federal Investigations into Pesticide Problems, Policies, and Government Practices, mid-1962--1964

U.S. Sets Up Panel to Review the Side Effects of Pesticides: Controls Studied -- Kennedy Finds Work Spurred by Rachel Carson Book (8-31-62:9)

DDT in Food Held Fatal to Eagles: U.S. Study Hints Pesticide Curbs Bird Population (11-11-62:49)

Pesticides Inquiry is Sought in House (5-3-63:18)

U.S. Orders Study of Two Pesticides: Scientists to Evaluate Role of Dieldrin and Aldrin (5-5-63:76)

Pesticide Danger May Exceed That of Fallout, Wiesner Says: President's Advisor Calls for Wide Study and Creation of a Center for Testing (5-17-63:13)

Udall, Citing Wildlife Poisoning, Urges More Pesticide Research (8-13-63:33)

Health Service is Making 6-Day Study of Pesticides (12-5-63:53)*

U.S. Scrutinizing Mississippi Fish: Shrimps Also Studied After Pesticide Residue Report (3-24-63:22)

Wildlife Inquiry Slated in Oregon: U.S. to Study Pesticides in the Klamath River Basin (5-24-64:50)

President Spurs Pesticide Quest: Asks $29 Million for Study of Safer Toxins and Use of Nonchemical Methods (7-10-64:31)

Pesticide Study Gains in Senate: Appropriations Unit Favors a $29,000,000 Outlay for Research on Safety (8-8-64:21)

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* The content of this article suggests this headline is a typographical error, and that it was probably meant to read "Health Service is Making 6-City Study of Pesticides".

the interests of government agencies and, in some cases, individual officials. The first of these occurs when calls for investigation are accompanied by increased appropriations to conduct the investigation. One proposal advanced in the post-Silent Spring era that would have resulted in enhanced revenues for its recipient was a call for the federal government to create "a large environmental health center" (New York Times, 5-17-63:13; see also New York Times 4-16-64:61; U.S. Congress, 1964). The USDI also continued to push for the lifting of its $2,650,000 annual funding limit for pesticide research (New York Times, 8-13-63:33; see also Dunlap, 1981:121; Bosso, 1987:128).

A second way in which investigations may advance an agency's interest is the potential for data generated by those investigations to be used to increase the agency's sphere of bureaucratic influence. As the lengthy quotation from the PSAC report cited at the beginning of this section illustrates, one of that Committee's recommendations was that the FDA undertake an evaluation of the scientific data on which tolerance levels for pesticide residues on raw agricultural products was based, with an immediate focus on data pertaining to some of the most widely used chlorinated hydrocarbons (e.g., aldrin, dieldrin, chlordane, lindane) and one of the most widely used organophosphates (parathion). The 1954 and 1958 amendments to the Food, Drug and Cosmetic Act had expanded the FDA's jurisdictional authority over pesticide

registration and use, the former by requiring the FDA to set tolerance levels for pesticide products prior to marketing and also limiting the USDA's registration of those products to uses which would conform to the FDA's tolerance levels, the latter by requiring the FDA to set zero tolerance levels for any food additive determined to be carcinogenic. Re-investigation of the scientific basis of existing tolerance levels at least posed the potential for yielding data that could be used to lower or even eliminate tolerance levels, hence extending the FDA's influence over the use of these products.

A third way in which investigations may advance the interests of government agencies and officials is the opportunity they offer to provide the public with visual evidence that the government is vigorously pursuing answers and solutions to some set of concerns about (an alleged) problematic condition (see Table 9) (cf. Edelman, 1964). Use of investigations in this fashion is apt to be particularly attractive given that agencies and officials are likely to meet with greater success in their efforts to undertake investigations than they are in their efforts to pass new legislation or modify existing government practices. For one thing, Congressional Committees and Subcommittees and government agencies have at least some discretional authority to instigate investigative actions on their own, whereas successful legislative responses require the approval of a

much more extensive set of actors.

Second, we would expect that opponents of change are more likely to negotiate compromise agreements to fund investigations than they are to change existing legislation and governmental practices. Given the often short duration of public and media attention to a particular problem area (Downs, 1972), investigations allow opponents of change a stalling mechanism -- in the short run they can bolster opponents' public image while in the long run there is the possibility that by the time the findings of investigations are completed and released public furor over the problem will have dissipated (cf. Edelman, 1964). The following quotation provides an example of the use of this strategy by the USDA:

> The Agriculture Department asked Congress today to delay action on a limited pesticide control program until it can study the subject from a broader perspective... [Secretary] Freeman's statement, read by an aid, said that the department favored holding two pesticide control bills introduced by Mr. Dingell 'in abeyance' until the department completed studies recommended by a Presidential advisory Committee. (New York Times, 6-19-63:13)

That the strategy of "waiting it out" may pay off in the end is suggested by the final conclusion reached by the Ribicoff committee in its 1966 report that "current pesticide use did not constitute a hazard to humans and...present precautions were adequate to safeguard public health" (Dunlap, 1981:124).

The use of investigations as a vehicle through which agencies and officials may reassure the public that the

government is diligently responding to some problem area can be seen in New York Times coverage of two investigative activities recommended by the PSAC: reevaluation of the scientific data on which pesticide tolerance levels were based, and monitoring of pesticide levels found in humans and the natural environment. As I have previously indicated, the PSAC report recommended that the FDA request the National Academy of Sciences to reexamine the scientific data undergirding the establishment of pesticide tolerance levels, focusing first on some of the most widely used chlorinated hydrocarbons.[11] The FDA began implementing this recommendation even before the official May 15, 1963 release of the PSAC's report, as conveyed in the following New York Times article:

> A special panel of the National Academy of Sciences has been set up at the Government's request to look into current tolerance levels and potential health hazards of two powerful insecticides [dieldrin and aldrin] that have been widely used for years.
>
> The Food and Drug Administration asked the academy to make the study 'as part of a re-evaluation of all our pesticide tolerance levels,' according to J. Kenneth Kirk, assistant commissioner. (New York Times, 5-5-63:76)

Actions undertaken by the Public Health Service (PHS) to implement the PSAC's recommendations for pesticide monitoring were reported in three New York Times' articles published in late 1963 and early 1964. The first article reported on a

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[11] One of the reasons existing data was considered inadequate was because "...most persistent chemicals in use had been registered before substantial testing for carcinogenic and teratogenic effects were required by the Federal Government" (Blodgett, 1974:214).

study being undertaken by the PHS in six cities "to measure amounts of pesticides present in air, water, food, and clothing" (New York Times, 12-5-63:53). The second and third of these articles reported on a PHS grant to Rutgers University to undertake monitoring of pesticide levels in the environment (New York Times, 2-9-64:IV,9; New York Times, 2-14-64:31). The second article goes on to note:

> The Rutgers project, according to the United States Public Health Service, is the first of a number that will be set up at major research centers across the country to study possible environmental contamination resulting from the increased use of pesticides and herbicides. (New York Times, 2-24-64:31)

A July 10, 1964 New York Times' article (Finney, 1964) reported a major initiative to secure increased funding for research into nonchemical means of pest control and also into pesticide safety. This initiative is noteworthy not only because of the large sum of money requested ($29 million) but also because of the involvement of President Johnson in making the request. This involvement was conveyed in the article's headline, **"President Spurs Pesticide Quest"**, and in the opening paragraph:

> President Johnson asked Congress today for $29 million more in the search for safer pest-control methods to replace the highly poisonous chemical pesticides now in widespread agricultural use. (Finney, 1964:31)

A subsequent article (New York Times, 8-8-64:21) reported on the approval of this request by the Senate Appropriations Committee, while a New York Times' editorial published on October 6, 1964 reported on final Congressional approval of a

$25 million funding package.

INTERAGENCY RELATIONS

The major gatekeeping mechanism to keep unsafe pesticide products off the market, or to prevent unsafe uses of pesticides, is the requirement that manufacturers register their products with a federal agency (in this case, the USDA) prior to marketing of those products (Rowland and Dubnick, 1982:216). For this reason, a major focus of FDA's efforts in the pre-Silent Spring era was to secure for themselves a legislatively-mandated role in the registration process. As I have previously explained, the 1954 and 1958 Amendments to the Food, Drug and Cosmetic Act provided such a role for the FDA (Blodgett, 1974; Dunlap, 1981; Bosso, 1987).

The USDI, in contrast, was still locked out of the registration process at the time of the publication of Silent Spring (Bosso, 1987). As I explained in Chapter Four, a bill to mandate consultation with the USDI by other government agencies prior to those agencies undertaking any pesticide treatment campaign -- the Pesticides Coordination Act -- was introduced in Congress in both 1960 and 1961 but failed to pass. The USDI's position on the bill at that time was at best lukewarm, largely because agency personnel believed they did not have the scientific knowledge necessary to carry out the requirements of the bill. By 1963, however, the agency's position had taken an 180 degree turn (U.S. Congress, 1964; Bosso, 1987).

Accordingly, one of the policy solutions advocated by the USDI and other members of the environmental constellation in the period immediately following publication of Silent Spring was to legislatively mandate USDI involvement in the registration process. A pair of companion bills to accomplish this was introduced in the 1963 legislative session by Rep. John D. Dingell (Michigan) in the House (H.R. 4487) and Senator Maurine Neuberger (Oregon) in the Senate (S. 1251) (Bosso, 1987). The Audubon Society reported that:

> H.R. 4487 would authorize the Secretary of the Interior, through the research facilities of the Fish and Wildlife Service, to screen chemicals in advance of their being placed on the market to determine their toxicity and danger to wild animals...Moreover, the Department of Agriculture would be required to take cognizance of the wildlife hazards in stipulating the warnings to be printed on the labels when the pesticides are packaged. (Audubon, 1963a:164)

We also see this change being advocated in the PSAC recommendation that:

> The Secretaries of Agriculture, Interior, and Health, Education and Welfare review and define their roles in the registration of pesticides that are not present on food, but that may impinge on fish and wildlife. (New York Times, 5-16-63:28)

H.R. 4487 was reported favorably on by the House Committee on Merchant Marine and Fisheries in summer, 1964 (Audubon, 1964a:243) and subsequently passed in the House (Bosso, 1987). The Senate Commerce Committee also reported out the companion bill S. 1251, but had deleted the labelling provisions (Audubon, 1964a:243). The Senate passed the weakened version of the bill. The two Chambers never managed

to work out a compromise between the two versions, and "both bills died with the 88th Congress" (Bosso, 1987:132). While similar bills were introduced in Congress during each session for the remainder of that decade, these, too, failed to pass (Blodgett, 1974:218-219).

The first New York Times article to cover this legislative effort was a June 7, 1963 piece reporting on Carson's testimony in favor of the Neuberger bill before the Senate Commerce Committee. This testimonial action was recounted in a lengthy piece on the controversy stirred up by Silent Spring in the New York Times following Carson's death (4-15-64:1,25). The bills were mentioned in two other New York Times articles published during 1963 (6-19-63:13; 11-10-63:50). An April 29, 1964 New York Times editorial entitled **"A Minimal Pesticides Bill"** encouraged passage of the legislation, asking:

> Can anyone think of a reason why a farmer or gardener should not be entitled to know if the chemicals he proposed to employ might poison birds when spread on fields or lawns, or kill fish if allowed to drain into a neighboring stream? (New York Times 4-29-64:40)

The final fate of this legislation was not reported in the paper.

Another important area of concern was USDI involvement in government spray campaigns and other aspects of pesticide use and regulation. As I explained in Chapter Four, while the Pesticides Coordination Act failed to pass in both 1960 and 1961, it was one of the factors spurring the 1961 formation of

the Federal Pest Control Review Board (FPCRB), formed of representatives from the USDA, USDI, HEW, and DOD (Department of Defense). The FPCRB did provide a formal mechanism through which the USDI/FWS could make known its opinion of various pest treatment campaigns, but because the Board was purely advisory in nature the Department had no way to force compliance with its recommendations. As a result of these perceived shortcomings of the FPCRB, Rep. John Dingell reintroduced the Pesticide Coordination Act (H.R. 2857) in the 1963 Congress (Audubon, 1963b:99).

This theme of legislatively-mandated interagency coordination received early dissemination in the post-Silent Spring New York Times' coverage. An April 14, 1963 article reported on the recommendation that the FPCRB "be given definite authority by law to review, modify, or veto pest control programs proposed by federal agencies" (Galton, 1963:62). While not specifically calling for legislative enactments, we see the advocation of this general theme in the PSAC recommendation that:

> The existing Federal advisory and coordinating mechanisms be critically assessed and revised as necessary to provide clear assignments of responsibility for control of pesticide use. The Panel feels the present mechanisms are inadequate. (New York Times, 5-16-63:28)

A May 23, 1963 article reported on the USDA's decision, following the recommendation of the FPCRB, to call off its plans to spray forests in Washington state with DDT. The article goes on to report that "[t]his is the first time that

the board has opposed a program since it was created in 1961" (Toth, 1963:39).

A June 7, 1963 (p. 38) article reported on Rachel Carson's testimony in support of the Pesticide Coordination Act before the Senate Commerce Committee, testimony that was recounted in an April 15, 1964 article. The bill was also mentioned in a June 19, 1963 (p. 13) article.

The event that placed the question of interagency coordination high on the government agenda, however, was the release in March, 1964 of findings by the PHS that traced a series of massive fish kills occurring in the lower Mississippi River since 1960 to the two extensively used chlorinated hydrocarbons aldrin and dieldrin (Anderson, 1964). The revelation that the USDI's Fish and Wildlife Service had tried to warn other federal agencies a year before the PHS's findings that "minute amounts of [chlorinated hydrocarbons]... could be lethal to fish" (Finney, 1964:55), and that this warning had been either overlooked or ignored by these other agencies, was particularly condemning. In his testimony before the Ribicoff hearings, which reconvened immediately following the release of the PHS's report, Secretary of the Interior Stewart Udall:

> acknowledged that the present government machinery for controlling the use of pesticides was 'not too satisfactory.' What is needed, he said, is some interagency coordinating group that would have a decision-making authority over the use of pesticides. (Finney, 1964:64)

Even Secretary of Agriculture Orville Freeman, in his

testimony before the Ribicoff hearing the following week (15 April, 1963), described the existing coordination among federal agencies as "very poor" (Finney, 1964:61).

As in the pre-Silent Spring era, the USDA sought to circumvent successful passage of legislation that would mandate the Department consult with the USDI/FWS prior to undertaking pest control treatment campaigns by proactively implementing administrative responses (Bosso, 1987). In the summer of 1964 the USDA, acting in conjunction with HEW and USDI, replaced the FPCRB with the slightly reconstituted Federal Committee on Pest Control (FCPC) (Blodgett, 1974; Bosso, 1987). The primary distinction between these two committees was in the range of issues considered appropriate for them to address. While the FPCRB had been limited to examining activities associated with pest control programs the FCPC allowed for the examination of a broader range of issues, including the coordination of research and registration activities among the USDA, HEW, and USDI (Blodgett, 1974:217), as well as advising "member departments on desirable program changes" (Bosso, 1987:130).

The formation of the FCPC was reported in an August 14, 1964 New York Times' article entitled **"New Federal Panel on Pesticides Set Up"** (p. 11). This article highlighted the broader range of issues that fell under the committee's purview. As had been the case in 1961, this administrative response seemed sufficient to side-rail Dingell's Pesticide

Coordination Act (Bosso, 1987). The New York Times did not report on the eventual fate of this bill.

ENDING PROTEST REGISTRATION

In this dissertation I have argued that environmental crises and controversies may present opportunities for government agencies and officials to pursue organizational, career, and personal goals. Taking advantage of the opportunities opened by these crises is not without risk, however. For example, it is hardly a boon to officials' and agencies' public image if, following their active engagement in publicly visible claims and actions that promote the labeling of a particular empirical condition as a "social problem", they subsequently fail to implement any kind of ameliorative response. In the previous two sections I have illustrated how the theme of diligent federal pursuit of answers and solutions to the concerns about pesticides raised by Carson was a pervasive feature of New York Times coverage of the mid-1962 through 1964 pesticide controversy. Of all the federal actions undertaken during this period, however, the one that was most extensively promoted (cf. Molotch and Lester, 1974) as a major solution to the pesticide problem was the 1964 amendments to the 1947 Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) which eliminated protest registration.

Essentially a "truth in labelling" law, FIFRA provisions required that pesticide manufacturers submit their product

labels to USDA for premarket registration. The USDA could refuse to register products if it deemed the recommended uses to be unsafe, or it if considered the product or its proposed uses would be ineffective against the targeted organisms (Blodgett, 1974; Bosso, 1987). Under the provisions of the 1947 act, however, pesticide manufacturers could go ahead and market products the USDA had refused to register "under protest". Theoretically, the USDA could take the manufacturer to court and, if the court sided with the USDA's argument, stop the sale of the product, but such actions took time.

Senator Abraham Ribicoff, whose Subcommittee hearings received such extensive New York Times coverage (described in the section on "Environmental Controversies and the State") introduced a bill to end protest registration on May 25, 1963 (Toth, 1963:33). This was one of the first actions undertaken in conjunction with his Subcommittee investigation. Furthermore, this bill was introduced in close temporal proximity to a number of other events (the May 15 release of the PSAC Report, the April 3 airing of "C.B.S. Reports: The Silent Spring of Rachel Carson", and the early June testimony at the Ribicoff hearings by Rachel Carson) that had provided the pesticide issue with a high level of public visibility.

That the existence of protest registration constituted a major shortcoming in federal pesticide regulation was conveyed in the headline of the article which announced the impending introduction of Ribicoff's bill. This headline read

"Insecticide Cited in Death of Girl, 8: Ribicoff Seeks Ban on Items U.S. Thought Hazardous but Had to Register: Law Held Inadequate: Senator Suggests Return to Fly-Swatter in Fighting Pests in the Home" (Toth, 1963:33). The article goes on to report that the death of the eight year-old girl reported in the headline was attributed to a vaporizer using the pesticide lindane, a product that was being marketed under protest.

Protest registration received further publicity in two New York Times articles that reported on Ribicoff's criticisms of the USDA's failure to release the names of products marketed under protest to a New York Times reporter (Toth, 1963:43; New York Times, 6-7-63:38). On the other hand, a USDA spokesman subsequently testified at the Ribicoff hearings that the department:

> supported a bill now in the Senate that would change current law that requires the Agriculture Department to register 'under protest' pesticides it considered unsafe. (Toth, 1963:40)[12]

Subsequent progress of the bill through Congressional channels is closely tracked by the New York Times. The paper informs us of approval of the bill by the Senate Agricultural Committee in October, 1963 (New York Times, 10-17-63:22), by the House Agricultural Committee in November, 1963 (New York Times, 11-15-63:21); the House Agricultural Committee in

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[12] The USDA had never supported the FIFRA provision that allowed for protest registration, but had acquiesced to industry demands at the time of the 1947 passage of the original legislation (Bosso, 1987).

January, 1964 (New York Times, 1-29-64:16), and the Senate in April, 1964 (New York Times, 4-9-64:64). Executive approval of the bill is reported in a New York Times article headlined **"President Johnson Signs a Pesticides Bill: Legislation Tightens Control Over Sales of Chemicals -- Rachel Carson Praised"** (Finney, 1964:49). The bill was signed into law by President Johnson in May, 1964, in a ceremony "attended by Congressional sponsors of the legislation and other Government officials" (Finney, 1964:49), with the President commenting that the FIFRA amendments "represented a 'happy moment not only for me but for the American people'" (Finney, 1964:49).

The theoretical analysis I have presented in this dissertation would suggest that a major motivation underlying both the introduction and passage of the FIFRA amendments was to provide the public with reassurance that the pesticide problem was being taken care of. Evidence to support this contention is provided by contrasting the image of the bill projected in the New York Times with Bosso's (1987) argument that the substantive impacts of the bill on existing pesticide practices was minimal. That the 1964 FIFRA amendments constituted essentially a symbolic rather than substantive response to the pesticide problem is reflected in the few times that pesticide products had been registered "under protest" since the enactment of the 1947 law:

> As a matter of fact no basic manufacturer of pesticides has ever so registered a product. A check has revealed (and Secretary Orville Freeman [of the USDA] so testified) that out of over 55,000 registrations made by

> USDA the Protest Registration device had been utilized 27 times. Such registrations have always concerned consumer products, usually short-lived. (Farm Chemicals, 1963:24)

As this quotation from Farm Chemicals (the publication of the National Agricultural Chemical Association) attests, industry was not opposed to the 1964 FIFRA amendments, another indication that the bill was not likely to result in substantial changes in actual pesticide practices. Such sentiments were also expressed in the following quotation from one of the leading chemical industry trade journals: "The bill [S 1605] is described in industry quarters as a 'good bill'" (Oil, Paint and Drug Reporter, 1963:3). Because of the small number of times the provision had been utilized, eliminating protest registration cost pesticide manufacturers little, while opposing such elimination would have cost them dearly in the public relations area (Blodgett, 1974:127).

A more critical assessment of the 1964 FIFRA amendments is offered by the Audubon society:

> There are indications the Department of Agriculture would be content to settle for this one correction in the present inept government procedures with respect to pesticides... The public must not be lulled into thinking the pesticide registrars and promoters have reformed, and all dangers removed, if protest registrations are eliminated. This loophole should be closed, and promptly. But, as Sen. Ribicoff's hearings have borne out, it is only a small part of the total problem. (Audubon, 1963c:289)

DEPOLITICALIZATION, SOFTENING UP, AND REPOLITICALIZATION: 1965-1969

Bosso (1987:132) labels the government action that occurred in the aftermath of Silent Spring a "reform wavelet".

While pesticides never completely exit either the government or public agendas during the 1960s, by 1965 their position on those agendas had dropped precipitously. Bosso (1987:132) notes that both the House and Senate averaged three pesticide reform proposals per session over the period 1964 to 1968. However, only two proposals beyond the 1964 FIFRA amendments ever passed, and the provision of both of these related to increasing USDI's funding for pesticide-related research.

Figure 1 (Chapter Four) shows the substantial drop in media attention to pesticide issues at this time. As can be seen in this figure, only three articles on pesticides were published in the three major newsweeklies and the Reader's Guide over the years 1965-1968. While coverage rates were higher in the New York Times than in the four media sources shown in Figure 1, the period of 1965-1968 does display lower rates of coverage than the 1963-64 and 1969 rates. Twenty-four articles were indexed under the heading "pesticides" in the year 1965, 36 in the year 1966, 20 in the year 1967, and 17 in the year 1968. In contrast, 58 articles were indexed under the heading "pesticides" in the year 1963, 72 in the year 1964, and 111 in the year 1969. These figures do not represent an exhaustive listing of New York Times coverage of pesticides over the time period 1963-1969, since articles are also indexed under other headings (including the specific pesticides names); however, this heading is the one that has consistently reported the largest number of articles across a

range of years and indexes, and hence likely gives a fairly accurate indication of the overall level of New York Times' coverage.

According to the agenda setting literature, media and public attention to a particular issue or problem area is generally short-lived (Downs, 1972; Cobb and Elder, 1983). Reasons given for this short attention span include boredom and news organizations need to continually generate "new" news (Gans, 1979), and declining public support following recognition of the costs involved in actually solving a particular social problem (Downs, 1972). Data does not exist that would allow for testing the applicability of these explanations to the present controversy. However, the analysis presented in this chapter does support Jasper's (1988) contention that actions undertaken by government officials that convey the message that "the problem is being addressed" tend to reinforce and perhaps even hasten public and media movement through the issue-attention cycle.

Jasper's model certainly suggests that it is hardly remarkable that the 1965 decline in media attention to the pesticide problem was immediately preceded by the enactment/creation of three publicly visible and publicly-constructed as substantial responses to the pesticide problem: the appropriation of $25 million for research on nonchemical means of pest control and pesticide safety, the passage of the 1964 FIFRA amendments that ended protest registration, and the

creation of the Federal Committee on Pest Control (an interagency advisory committee). The President's involvement in the first two of these helped to further reinforce their construction as a "substantial response". This image of efficacious government response is further reinforced by the headline of the first article on pesticides to be published in the New York Times in 1965, **"Experts Review Pesticide Progress"** (Widstooth, 1965: II, 27).

As can be seen in Figure 1, high agenda placement of pesticides reoccurred in 1969. The events precipitating this placement was movement toward the banning of at least some uses of the well-known chlorinated hydrocarbon DDT by the federal government and two state governments (Wisconsin and Michigan) (Graham, 1970; Blodgett, 1974; Dunlap, 1981). While I do not undertake an extensive examination of these events, it is useful to note that efforts to ban DDT, as well as reduce or eliminate the use of other persistent pesticides, provide a good illustration of the softening up process (Kingdon, 1984). We see advocation of this proposal in the PSAC recommendation that:

> The accretion of residues in the environment be controlled by orderly reduction in the use of persistent pesticides. (New York Times, 5-16-63:28)

According to Blodgett (1974), this was the most controversial of the PSAC recommendations. The USDA did not make any progress in implementing this recommendation until 1969, "when it canceled some uses of DDT" (Blodgett, 1974:222). Calls for

such banning by pesticide critics begin considerably before this, however, as conveyed in the following two headlines: **"Udall Asks a Ban on Key Pesticides: Persistent Agents Opposed for Agricultural Use"** (New York Times, 4-9-64:64), and **"Time to Quit Using DDT"** (New York Times, 5-27-64:38). Hence, even as the first wave of reform was winding down, pesticide critics were already undertaking action that would eventually push pesticides back onto a prominent place on the public and government agendas.

CHAPTER SIX

CONCLUSIONS

In this, the concluding chapter of my dissertation, I discuss the following three topics: 1) summary of major findings and theoretical contributions, 2) weaknesses and drawbacks of the study, and 3) suggestions for further research.

SUMMARY OF MAJOR FINDINGS AND THEORETICAL CONTRIBUTIONS

In this dissertation I undertook an in-depth case study analysis of the controversy that occurred over the use of synthetic organic pesticides from the period of their first initial widespread use in war-related efforts (mid-1940s) through the years immediately following the 1962 publication of Rachel Carson's Silent Spring. My focus in this analysis was on examining the impact the claims and actions of government officials and agencies, and the dissemination of those claims and actions through the popular news media, had on the nature, dynamics, and outcomes of this controversy. I examined a variety of documentary material in conducting this research project, including secondary sources, over 400

articles on pesticides published in the New York Times, Congressional committee and subcommittee hearings, and environmentalists and industry literature.

This case study analysis was developed through the use of ethnographic content analysis (Altheide, 1987), a research strategy that employs the deductive approaches of grounded theory (Glaser and Strauss, 1967; Charmaz, 1985; Strauss and Corbin, 1992) to documentary material. Insights from six bodies of literature (social constructivism, conflict theory, media-government relations, agenda setting, Jasper's model of the political life cycle of technological controversies, and institutionalist perspectives on the state) were used to develop a coherent theoretical accounting of this case. In this section I discuss the contributions each of these bodies of literature made toward helping me understand this case, as well as aspects of the case that did not accord with the expectations of these works.

I developed two major arguments regarding the role of government agencies and officials in environmental controversies. The first of these was that government agencies and officials are in a particularly privileged position to influence the nature, dynamics, and outcomes of environmental controversies. This is so for two reasons. First, various literatures (Sigal, 1973; Molotch and Lester, 1974, 1975; Tuchman, 1978; Gans, 1979; Herman and Chomsky, 1988) have posited a largely symbiotic relation between

popular news media and the state. Such a relationship suggests that government agencies and officials will be more successful than any other set of claimsmakers in having their claims and actions disseminated through popular media sources. Second, most of the solutions advocated to address environmental problems involve some type of government action.

In Chapter Five I presented evidence in support of this first major argument. I demonstrated that federal claimsmakers received far more extensive coverage than any other set of claimsmakers, appearing in just over 50 percent of the 142 pesticide-related articles published in the New York Times between mid-1962 and 1964. As a point of contrast, the second most frequently covered claimsmaker, Rachel Carson, appeared in just over a third of these articles. I also illustrated how Carson's work first defined the federal government as the primary institutional sphere within which solutions to pesticide problems were to be pursued, and how this definition was carried over into the New York Times. Slightly more than half of all articles published in this source between mid-1962 and 1964 discussed one or more response actions undertaken by, or proposed for, the federal government.

The second major argument I developed pertained to using the institutionalist perspective on the state (Skocpol and Finegold, 1982; Skocpol, 1985; Buttel, 1985; Campbell, 1985; Hoberg, 1992; Carruthers, 1994) to account for the nature of

the actions undertaken by some government officials and agencies in this controversy. The institutionalists regard state personnel as players in the political process, players who strategically operate to advance organizational, career, and personal goals. This perspective suggests that environmental controversies may in some cases present opportunities for government officials to further these interests. In this dissertation I illustrated how officials in the Food and Drug Administration and the U.S. Department of Interior used concerns raised about pesticides to promote organizational interests of increased resources and bureaucratic authority.

A second focus of institutionalist analyses of the state is on examining the way in which the state as an institutional order impacts the policy process (or, in the present case, environmental controversies). Using this component of the institutionalist perspective I documented how various research and regulatory mechanisms erected in the FDA and USDA in the pre-DDT era to detect various unintended side effects of pesticides resulted in these agencies being among the first to detect potential problems when the new synthetic organics came on board in World War II. The U.S. Department of Interior became involved in this institutionalized monitoring of pesticide impacts in the second half of the 1940s.

The agenda setting literature (see particularly Kingdon, 1984) provided insight into the ways in which government

action impacted the nature and dynamics of the broader pesticide controversy. One valuable concept drawn from Kingdon's work was that of "softening up". Application of this concept to an environmental controversy would lead us to expect that new environmental problems, or policy solutions to those problems, do not burst on the scene overnight (though they may sometimes appear to do so). In Chapter Four I demonstrated concerns had been expressed about, and political action undertaken with regards to, pesticides for well over a decade prior to the 1962 publication of Rachel Carson's Silent Spring. I also documented that claims pointing to potential negative impacts stemming from the use of DDT (such as accumulation in soils or destruction of insect parasites and predators) were being disseminated in the New York Times as early as 1945.

Softening up is also important for proposed policy solutions. In this dissertation I document actions undertaken by the FDA and the USDI to secure increased research funding and regulatory authority to address pesticide problems in the 1950s; these two "softened up" options became the backbone of government response to "the pesticide problem" in the aftermath of Silent Spring. Another insight drawn from the agenda setting literature was Kingdon's (1984) observation that bureaucratic officials and personnel (civil servants) are most typically involved in specifying policy alternatives to problems entered on the political agenda. I further elaborate

the value of this contribution below.

The social constructivist perspective encouraged me to approach this controversy as a claimsmaking episode, focusing on the way in which the claims and actions of various claimsmakers shaped the nature, dynamics and outcomes of the controversy without regard for the validity of any particular set of claims (Spector and Kitsuse, 1977; Gusfield, 1984; Schneider, 1985; Best, 1989; Gamson and Modigliani, 1989). I discuss the value of this contribution below. This perspective also encourages treating "news" as a jointly constructed product stemming from the purposeful actions of news promoters and news assemblers (Molotch and Lester, 1974). Using this perspective I was able to develop an argument regarding how the New York Times constructed the May, 1963 President's Science Advisory Committee report on pesticides as the definitive government statement on the pesticide problem and needed solutions. This demonstration occurred through revealing the following pattern of federal claimsmaking in the New York Times: (1) the initial appearance of federal claimsmakers in the New York Times following publication of the excerpts from Silent Spring in the New Yorker was associated with the announcement that the PSAC would undertake an investigation into Carson's claims; (2) in the eight month period between this announcement and the release of the PSAC findings federal claimsmakers largely dropped out of sight, at least as far as the paper coverage was occurred, and most of

the times they did appear in paper coverage it was in relation to PSAC activities; and (3) following the release of the PSAC report a flurry of federal actions, and New York Times coverage of that action, ensued.

The social constructivist perspective also helped me to understand how the news media and government jointly constructed resolutions to this controversy. In particular, the involvement of President Johnson in two resolutions undertaken in 1964 -- the passage of a major ($25 million) appropriations bill for research on nonchemical means of pest control and pesticide safety, and the passage of amendments to the Federal Insecticide, Fungicide, and Rodenticide Act which banned protest registration (a provision that had allowed manufacturers to market products not approved by the government) -- gained these resolutions public visibility. At the same time, as I explained in Chapter Three, I did not find the constructivist perspective adequate in and of itself to provide a thorough theoretical accounting of the events of this case. Since other perspectives (such as conflict theory and agenda setting) have long explored the social context within which claimsmaking occurs, it is reasonable to assume that they would provide insights into factors that shape the claimsmaking process. In this dissertation I have used the various literatures discussed in this chapter and elsewhere in this fashion.

Jasper's (1988) model of the political life cycle of

technological controversies had partial applicability to this controversy. Jasper posits a five stage model of technological controversies that move through conflict escalation and de-escalation. These stages are: pre-political (no conflict), politicalization (limited conflict), political (high conflict), depoliticalization (declining conflict), and resignation (no conflict). The controversy reported in this dissertation did follow the general "life cycle" pattern of low conflict--high conflict--low conflict. Other works (Downs, 1972; Cobb and Elder, 1983; Kingdon, 1984) also predict that items will not retain placement high on public and government agendas for very long.

In other respects, application of Jasper's model to this controversy was more problematic. It was not always easy to demarcate the five stages Jasper posited. There was, for example, no time during the period studied in this dissertation (1944-1969) when we find an absence of conflicts over or concerns about synthetic organic pesticides. This is because this particular controversy is only one in a reoccurring cycle of controversies over pesticide use that began back in the 1920s and continue through to the present. In this sense, the only period that can probably be correctly labeled "pre-political" is the late nineteenth and early twentieth century, when pesticide use was deemed a strictly agricultural concern (Whorton, 1974).

Likewise, while media and government attention to

pesticides did drop substantially in 1965, they returned with renewed vigor in 1969. Modification of Jasper's (1988) model to better capture these reoccurring cycles of controversy is needed. Kingdon's (1984) work on agenda setting might prove particularly valuable here. Kingdon argues that individuals and groups knowledgeable of the policy process understand that most changes in policy direction occur in small increments over long periods of time, and even these incremental changes are only likely to occur after considerable effort has been invested to "soften up" the policy community to the need for and desirability of those changes. Kingdon's work thus suggests that even during periods of limited controversy we will find a few dedicated groups and individuals working to soften up policy options; when the controversy enters another cycle of conflict escalation these groups and individuals are ready to mobilize to take advantage of the opportunities heightened media and public attention affords.

I also found it difficult, using Jasper's model, to demarcate the political stage from that of depoliticalization. According to Jasper, depoliticalization of a technological controversy is reinforced or hastened by government action, which sends a message of reassurance to the public that the problems raised about the technology are being taken care of. I could not use government action <u>per se</u> as demarcating the depoliticalization stage, however, since government response followed close on the heels of the <u>New Yorker</u> excerpts, and

since much of that action tended to reinforce the validity of Carson's claims. I return to the problems I encountered in trying to use models that posited government officials and agencies response to a technological controversy would be one of conflict avoidance-containment-defusement below. Despite these shortcomings, I did find that Jasper's argument that government officials would play an important role in depoliticizing the controversy an accurate one. I explained above how the New York Times and government officials jointly constructed resolutions to the "pesticide crisis" in 1964.

The final body of literature used in this research was that of conflict theory (Eitzen and Baca Zinn, 1991). Conflict theory sensitizes researchers to be on the alert for differing levels of resources (e.g., wealth, legitimacy, power) claimsmakers bring to environmental controversies and the ways in which those differing levels impact the nature, dynamics, and outcomes of those controversies. There were several instances in which the events occurring in this controversy did not conform to the expectations of the conflict perspective. For example, conflict theorists maintain (Bagdikian, 1990) that popular media sources will give extensive dissemination of claims about and typifications of social problems that protect the interests of corporate elites, while claims and typifications threatening to those interests will receive limited coverage, and that typically not of a favorable nature. In contrast, when I examined New

York Times' coverage of the post-Silent Spring pesticide controversy I found just exactly the opposite of this expectation: the coverage was overwhelmingly favorable to Carson's views, while the chemical industry and other pesticide defenders received limited coverage in that publication.

On the other hand, New York Times' articles on pesticides in the immediate aftermath of Silent Spring (mid-1962-1964) did give extensive coverage to another set of societal elites, that of federal government officials and agencies. The nature of this coverage only partially conformed to the expectations of conflict theory, however. Conflict theorists (cf., Marger, 1987) view the state as acting to protect and promote the interests of corporate elites, and the capitalist class more generally. Since corporations are frequent perpetrators of environmentally-destructive activity, and accordingly the frequent targets of policy changes promoted to correct those problems, conflict theory would lead us to expect that the state will respond to existing, emerging, or threatening environmental crises and controversies by engaging in actions to avoid, contain, or defuse those controversies. As I have previously indicated in my discussion on Jasper's model, however, much of the federal claims and actions being disseminated through the New York Times in the time period mid-1962 through 1964 could hardly be classified as efforts to avoid, contain, or defuse the controversy.

On the other hand, the outcome of this controversy is much more in line with the expectations of conflict theory (as well as Jasper's model of technological controversies). This is so in two senses. First, while in the short term government actions did not work to contain this controversy, by 1964 such containment had occurred (though, as the reemergence in 1969 indicates, such containment was only temporary). I discussed these events earlier in this chapter when I illustrated how news media and government officials jointly constructed the 1964 FIFRA amendments and a major pesticide research funding package as solutions to the concerns raised by Carson.

Second, the actual impact of the policy changes implemented in the aftermath of Silent Spring on pesticide practices was minimal. As Bosso (1987) argues, these changes were essentially symbolic rather than substantive. According to Blodgett, by 1964:

> ...the agricultural-pesticides policy-makers composed of Congressmen, bureaucrats, and clientele successfully defended the USDA's preponderance of authority in the regulation of pesticides. (1974:219)

It is here we see the value of the conflict theory's attention to differential resource levels and the impacts these have on environmental controversies. In this case, pesticide critics had to fight a powerful and well-entrenched subgovernment system (Bosso, 1987; Hansen, 1991), a system that was largely able to defend its turf against the kind of policy changes and intrusions sought by the critics. As Bosso (1987:132) put it,

"the post-Silent Spring wavelet ran its course by mid-decade, with the farm bloc fractured but no shattered."

In the end, then, I developed a theoretical model of the role of government agencies and officials in environmental controversies that used institutionalist perspectives on the state to expand and modify, rather than counter and replace, the conflict avoidance-containment-defusement model. Indeed, even the institutionalist perspective would lead us to expect that while government officials and agencies may seek to take advantage of opportunities presented by environmental controversies in the short term, in the longer term the pressures will be toward conflict resolution. Without such resolution, government officials and agencies will risk appearing ineffective. Agencies' and officials' legitimacy may also be called into serious question if members of the public perceive themselves as being exposed to some kind of hazard from which the government has failed, and continues to fail, to offer protection.

While the conflict avoidance-containment-defusement model captures the outcome of this environmental controversy, the fact that much of the dynamics preceding that outcome, and even the exact content of the policy outcomes, is heavily influenced by government agencies and officials seeking to take advantage of the opportunities presented by the controversy means that a full understanding of this controversy must also examine and explain these elements of

state action. In concluding this section on "major findings and theoretical contributions" I offer some suggestions on why my analysis of the role of such government agencies as the USDA, FDA, and USDI/FWS in this controversy differs from that given by movement activists and sympathizers (Graham, 1970; Hynes, 1988). As I indicated in Chapter One, these authors have raised a much more critical assessment of the federal government's involvement in pesticide activities. State actions were seen to contribute to the problem (for example, through federally-supported spray campaigns and federally-conducted or funded research that promoted pesticide use), as well as present formidable barriers to reform efforts. Given the early dates at which government agencies had knowledge of potential detrimental impacts of synthetic organic pesticides, it is not difficult to see how they could be subject to criticisms regarding why it took them so long to act on that knowledge (and then acted only under duress).

My purpose in this dissertation has not been to invalidate these criticism, but rather to argue that to orient oneself toward state action only in a purely critical mode obscures the complex and sometimes subtle ways in which state claims and actions influenced the nature, dynamics, and outcomes of this controversy. There are three key reasons why my analysis differs from these earlier works by drawing attention to ways in which government agencies and officials contributed to and/or took advantage of this controversy. One

important factor was my approaching this controversy with a constructivist orientation. The above-mentioned authors offer the kind of critique of government actions that they do because they have accepted as valid the concerns Carson and other pesticide critics have raised about pesticides. Starting from this position, their focus is on implementing solutions to the pesticide problem and they accordingly highlight those elements of state action seen to inhibit successful pursuit of those actions.

The constructive approach, in contrast, begins from the position that researchers should not make assessments about the validity of claims about the empirical world. As Gusfield (1984) puts it, researchers using the constructivist perspective should be "on the side" analyzing social problems controversies, not taking sides in those controversies. Using a constructivist orientation I analyzed this controversy without taking a position on whether the claims of the pesticide critics or those of the pesticide defenders were the correct ones. My goal was not to defend or castigate either side of the controversy but rather understand how the controversy was shaped by claimsmaking activities.

A second way in which my analysis differs from that of the pesticide critics and conflict theorists is less of a tendency to treat "the state" as a monolithic entity. If a claimsmaker's goal is to seek change, then pointing out the resistance of 'the government' or a particular government

agency such as the USDA to change is sensible. When trying to understand the way government agencies and officials influence the nature, dynamics, and outcomes of environmental controversies, however, it becomes important to recognize that the existence of even a few individuals in an agency pushing for change may have significant ramifications for controversy development. Government insiders are important because of the political connections such insider status may afford, because they are particularly well placed to both 'soften up' policy proposals and to gauge when a 'policy window' is opening, and because of possibly privileged access to news media (Kingdon, 1984; Campbell, 1985).

Third, the fact that government bureaucracies and bureaucrats generally prefer to operate 'out of the limelight' (Kingdon, 1984) may make it more likely that analysts will not perceive ways in which their actions contribute to, or take advantage of, controversies and conflicts. Indeed, the fact that much of their activity is occurring out of the public eye could readily encourage assessments that they have something to hide, assessments that no doubt in some cases would be valid.

This problem is further compounded by agencies need to maintain legitimacy in the face of controversy, particularly when their own actions are being called into question. Paying attention to only publicly-visible claims and actions of a particular government agency may, therefore, give an

incomplete picture of the full range of agency response to an environmental controversy or crisis. Both because it does not want to lose legitimacy nor cause public panic (Edelstein, 1988), an agency may publicly downplay an environmental hazard. We see this in the present case, for example, when the FDA disseminates through popular news media following publication of Silent Spring that tests performed on the nation's food supply show very minimal (and perfectly safe) levels of pesticide residues. At the same time they are giving public reassurances, however, agency personnel may also be working 'behind the scenes' to address concerns raised in the controversy or crisis, and/or to use those concerns to accomplish agency goals.

WEAKNESSES AND DRAWBACKS OF THE STUDY

In addition to empirical and theoretical contributions discussed in the previous section, the work presented in this dissertation also had a number of weaknesses and drawbacks. The sole reliance on documentary material, while allowing for exploration of past events, also presents drawbacks. Actors do leave traces of their activities behind in such materials but, of course, documents never totally recreate the events as they happened. Detailed observational studies of and in-depth interviews with government officials, media personnel, and other claimsmakers as these events unfolded would have proved valuable had it been possible to undertake such actions. As it is, there remain many questions about this controversy we

simply do not have the data to answer. For example, while government officials may act as "news promoters" and may have more extensive access to media channels than other claimsmakers, in the end it is the media that act as the ultimate gatekeepers, deciding what items of news will actually be disseminated (Gans, 1979). The existing documentary material simply do not tell us whether or not, and if so, the extent to which, certain claims and actions promoted by government officials as news in fact failed to be disseminated in the media.

The fact that the research reported in this dissertation pertained to a single environmental controversy, and only one particular phase of that controversy, greatly limits (if not precludes) our ability to generalize research findings to other environmental controversies, or social problems controversies more generally. On the other hand, in their original work on grounded theory techniques Glaser and Strauss (1967) argued that the value of, and need for, grounded studies stemmed from the failure of existing theoretical models to capture fully the complexity of the social world. As is the case with all varieties of research then, application of grounded techniques to an in-depth case study presents both strengths and weaknesses, advantages and disadvantages. One of the initial costs of such research is questions of generalizability, one of the potential payoffs is the generation of new lines of research. It is to this latter

issue that I now turn.

SUGGESTIONS FOR FURTHER RESEARCH

In this dissertation I have argued that government agencies and officials are particularly well-placed to influence the nature, dynamics, and outcomes of environmental controversies, both because of their symbiotic relationship with news media and because in representational democratic governments like we have in the U.S. the government is frequently the primary institutional sphere through which solutions to environmental controversies are sought. I reported findings from my analysis of New York Times' coverage of pesticides in the immediate post-Silent Spring period (mid-1962-1964) that provided empirical support for this argument. Comparative studies need to be done to address whether the state's role in framing the contours of public discourse occurs in other environmental controversies, as well as in other kinds of social problems controversies. Comparative work may also lead to more complex theoretical models specifying the kinds of situations and conditions where government agencies and officials may generate, contribute to, or take advantage of controversy and conflict, and those situations and conditions where they will seek to contain and deflate controversy and conflict.

At this point, for example, there is reason to suspect that government agencies will find unexpected environmental crises and disasters more threatening than long-brewing

controversies. Among the kinds of threats posed by such crises and disasters are the possibility of high levels of media and public scrutiny and immediate expenditures of agency resources to address the crises (expenditures that may or may not be reimbursed or lead to higher funding levels down the road). Case studies of environmental crises and disasters have repeatedly shown agencies responding to these crises in a hesitant fashion, with agencies particularly reluctant to shoulder the responsibility of response in cases where jurisdictional authority is vague (Levine, 1982; Kroll-Smith and Couch, 1985; Clarke, 1988; Edelstein, 1988; Reich, 1991).

Another set of research concerns falls under the general area of the sociology of science and technology. One aspect of the present case study that could be more fully developed using this approach is that of the origins of various concerns about synthetic pesticides and the lines of dissemination and influence of these ideas. What scientists were engaged in research that suggested there might be potential problems with such synthetic organics as DDT? Of these scientists, were there any that became concerned enough to advocate or seek changes in pesticide policies and practices? If so, when did they start undertaking these actions, what actions did they undertake, and who did they contact in their efforts to seek change?

Latour's (1987) constructivist work on science could also be fruitfully applied to various aspects of scientific work in

pest management. According to Latour, for techno-science projects to be successful (that is, get funding and, after development, be adopted) they must enroll a diverse range of actors, including funding agencies, scientists, and clients. One period of time to which Latour's work could be applied is the late 19th and early 20th centuries, when pest management and control was first being institutionalized into the then-fledgling discipline of economic entomology (Dunlap, 1981). While a number of different pest control strategies were initially pursued, including biological controls, by the late 19th century chemical controls had become the dominant method. Latour's work would lead us to raise the following types of questions about this time period: How did early economic entomologists attempt to enroll farmers in various pest control strategies? How did farmers respond to those strategies? How did farmers' response impact on the kinds of research and development activities pursued by economic entomologists? How did federal and state legislation shape the essential abandonment of biological, physical, and cultural controls in favor of chemical controls?

A closely related research concern pertains to the history of biological controls in the aftermath of Silent Spring. Carson advocated biological controls as a more environmentally-benign method of pest control in Silent Spring. Is there increased funding for and research on biological controls after this time period? If so, how

extensive is the change? Did chemical controls continue to dominate after this time period, or has biological control emerged as a viable alternative? What has been the nature of popular media coverage of biological controls in the time period since Silent Spring?

As is generally the case with research projects, this project has generated more questions than it has answered. More generally, it suggests that sociologists and other social scientists still have much to learn about both pesticides and environmental controversies.

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