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THE FEDERAL REGULATION OF PESTICIDES

A Dissertation Presented

By

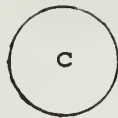
CHARLES L. GUERIN

Submitted to the Graduate School of the
University of Massachusetts in partial fulfillment
of the requirements for the degree of

DOCTOR OF PHILOSOPHY

May 1983

Political Science



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FEDERAL REGULATION OF PESTICIDES

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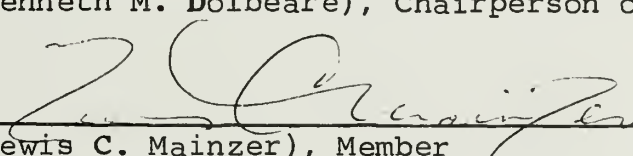
By

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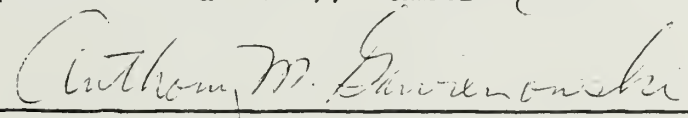
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DEDICATION

To my wife, Betsi.

ACKNOWLEDGEMENT

I wish to express my sincere appreciation to the members of my dissertation committee Lewis Mainzer, Anthony Gawienowski and the chairman, Kenneth Dolbeare. I would also like to thank John Perkins for reading a copy of the dissertation and offering many useful suggestions. Many members of the University of Massachusetts library staff provided valuable assistance especially Leonard Adams, Janice Doyle, John Gnatek and William Thompson of the Government Documents section, and Ute Bargmann, Edla Holm, and Judith Schaefer of the Interlibrary Loan Office. Finally I would like to thank my wife Betsi for the support she has given me.

28 April 1983

CLG

Montague, Massachusetts

ABSTRACT

The Federal Regulation of Pesticides

May 1983

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The Federal Regulation of Pesticides is analyzed and evaluated on the basis of defined environmental criteria and found to be inadequate for two reasons. The first is that the Agriculture committees in Congress which have jurisdiction over the primary law regulating pesticides have been successful in their efforts to enact a weak law and when the EPA enforced the legislation more than most of the Committee members wanted, to weaken the law further. They have done this by depoliticizing the pesticide issue as much as possible. Depoliticization has been achieved by passing a law with ambiguous standards, weakening the law by enacting many small, less visible revisions to it, making it needlessly complex, interfering with its

enforcement, and claiming that these actions are an attempt to make pesticide regulation more "rational" or "scientific."

The second reason is that the generation of the information available to the public, regulators, and legislators concerning the risks and benefits of pesticides is heavily influenced by the pesticide manufacturers, pesticide user groups and farm groups all of which tend to support less stringent regulation. Pesticide testing for safety is done by the manufacturers. Several examples are presented to support the contention that, at best, the manufacturers often tend to interpret test results in a way that minimizes the dangers to human health posed by their products. The schools of agriculture in the nation's land grant universities are a source of much information concerning pest control and the benefits of pesticides. Because of the close relations and shared attitudes between these institutions and pesticide manufacturers, users and farmers these schools tend to devote too much attention to chemical means of control and too little to more environmentally sound technologies. Many industry scientists promote

a point of view concerning the standards for determining carcinogenicity which is in contrast to the views of many other researchers. For example the applicability of animal tests to humans is often questioned. The dissertation examines the industry role in promoting its point of view concerning carcinogenicity.

TABLE OF CONTENTS

ACKNOWLEDGEMENT	v
Chapter	
I. INTRODUCTION	1
The Pesticide Industry	4
What This Dissertation Will Do	7
FIFRA, Congress and the EPA	13
What This Dissertation Will Not Do	16
Policy Analysis and Values	18
Sources	24
The literature on pesticides	27
II. PESTICIDES: THEIR EFFECTS AND SOME CRITERIA FOR REGULATION	36
Effects of Pesticides	36
Toxic effects	37
Carcinogenicity, mutagenicity, and tertatogenicity	40
Environmental effects	44
Effects on insect resistance and natural enemies	45
Criteria for Pesticide Regulation	53
A strong law	54
Requiring IPM	57
Effective enforcement	66
Accurate data	67
III. PESTICIDE REGULATION: 1910 to 1980	76
Introduction	76
Pesticide Regulation 1910-1970	77
1910-1947	77
Post World War II to Rachel Carson	81
Pesticide politics in the sixties	86
1970-72 A New Agency to Regulate and A New Law to Administer	98
Pesticide regulation goes to the EPA	98
1972: A major revision of FIFRA	100

1973-1975: EPA Enforcement and Congressional Reaction	122
1973-1975 Interest group reaction, congressional pressure, and GAO criticism	122
1975 Revision of FIFRA	124
1975: FIFRA revised	130
1976: Some Critical Reports and a Vetoed Veto	145
A restrained and disorganized EPA	145
A presidential veto	154
1977-1978: FIFRA Revised Again	157
More criticism of pesticide regulation	157
FIFRA revised	160
1979-1980 Legislative Veto and More Scientific Input	168
Another change to FIFRA	168
FIFRA in 1980	174
 IV. CONGRESS AND THE REGULATION OF PESTICIDES ...	196
Depoliticizing FIFRA	196
The Participants	200
The producers and the users	200
Friends of the farmer	202
Other participants	203
The public interest groups	204
Resources, information and the quality of testimony	205
Public opinion	209
Committees Involved in Pesticide Regulation	212
The agriculture committees	212
Other committees	216
Congress: Weakening the Law	222
Explanations	224
Many small changes	231
Congressional interference with enforcement	235
DDT and the tussock moth	238
The pesticide hotline	242
Summary	249

V. TESTING FOR SAFETY	261
A Science Based Language	261
Requirements for Testing and Problems	266
Testing requirements	266
Early indications of problems	267
Kennedy and others discover the problem	268
Industrial bio-test	271
IBT an isolated case?	274
The EPA: An Unenthusiastic Auditor	276
Economic Influences on Scientific Judgement	279
Other Ways to do Testing	282
VI. INDUSTRY AND ACADEME	290
The Entomologists	291
Similarity of opinion	294
Ties to industry	297
Support for pesticides	299
The University of California	301
DBCP	304
The Council for Agricultural Science and Technology	310
Support from industry	312
CAST reports	314
Protest over antibiotics	318
Agricultural scientific support for CAST	319
Motivation	321
Other Possibilities	323
VII. WHOSE VIEW OF CANCER?	331
How Testing Is Done	333
Testing Controversies	336
Animal testing	337
Dosage	339
Thresholds	340
Benign tumors	341
Promoting a Point of View	341
Policy makers and scientific controversies	344
A communication advantage	348
Communicating with farmers	349
Concepts and regulation	352

VIII. SOME FINAL CONSIDERATIONS	358
Examining the Criteria	359
The pesticide law	360
Enforcing FIFRA	362
Accurate data	367
IPM	368
Congress: Avoiding Conflict	373
No change in criteria	373
Some theoretical explanations	376
FIFRA: a disguised choice	381
Legislation, pressure, and selective perception	392
Legislative revision and congressional pressure: a continuous process	397
Depoliticizing FIFRA	401
Language	402
Influencing bias	403
Other Explanations	407
Attitudes and knowledge	407
On solutions	410
Closing Observations	412
Resources	413
Congress: depoliticizing and dealing with conflict	413
Mobilizing information	416
Solutions	417
.....	
BIBLIOGRAPHY	422

C H A P T E R I

INTRODUCTION

The problem of toxic substances in the environment has become a primary environmental issue. This issue includes such problems as toxic waste disposal and the presence of allegedly harmful chemicals in food, drinking water or the air. In testimony to Congress given in 1980 the Surgeon General of the United States said:

We believe that toxic chemicals are adding to the disease burden of the United States in a significant, although as yet not precisely defined, way.¹

As the technological basis of our economy expands, more toxic products and wastes will be produced and the issue of their control will be one of the major problems of at least the next decade. This dissertation will analyze and evaluate one aspect of the toxic substance problem, the federal regulation of pesticides.

The pesticide problem can be seen as part of a large class of technological problems which now confront, and

will confront, the United States. These important issues are very complicated and to understand them requires a considerable investment of time. As Eugene B. Skolnikoff has pointed out, the complicated nature of many technological issues puts them at a distance from the public and tends to make more difficult the approximation of the ideal of democratic decision-making.² Their complicated nature also increases the opportunity for symbolic manipulation of the issue and distortion of the facts.

Before proceeding further we should be clear about what we mean by "pesticides." Pesticides are chemicals which are used to kill or control pests. Some of the most common types are the following:

- 1) Insecticides, which are used to control insects
- 2) Acaricides, which are used to control mites and ticks (mites and ticks are not, strictly speaking, insects, but acaricides are often included in the general term "insecticides")
- 3) Herbicides, which are used to control weeds
- 4) Nematicides, which control the microscopic organisms known as nematodes which parasitize plants

- 5) Molluscicides, which are used to control slugs and snails
- 6) Fungicides, which are used to control fungal diseases of crops, stored produce, and fabrics
- 7) Bactericides and viricides which control bacterial and viral diseases of crops and
- 8) Rodenticides, which are used to control rodent mammals.³

In the following chapters some of the harmful effects of pesticides will often be described. This should not lead the reader to conclude that the author is against the use of all pesticides. The opinion underlying this dissertation is that pesticides in general should be used less and that some of the more harmful ones should be more stringently regulated or eliminated from use completely. This does not mean that in the foreseeable future there will not be a need for the careful use of these chemicals. Pesticides can help to reduce crop losses and are very important in the control of such insect borne diseases as sleeping sickness, malaria, river blindness and yellow fever.⁴ Furthermore, control of such pests as species of mosquitoes which do not cause diseases, contributes to human comfort and well being.⁵

The Pesticide Industry

There are two aspects of the manufacture of pesticides. A basic (or technical) product is first manufactured. Then the basic products are formulated into end-use products for sale to the consumer. Some manufacturers of technical products also formulate them into end-use products, but usually the processes are carried on by different firms. In the United States there are about 400 manufacturers of approximately 1400 different active pesticide ingredients. These ingredients are produced in about 2500 basic products which are formulated into an estimated 35,000 to 50,000 separate end-use products by 4600 companies. Thus 90 percent of pesticide producers depend on the other 10 percent for their supply of active ingredients.⁶

At the level of the manufacture of the basic product, the industry is very concentrated. Only 12 products account for more than 40 percent of all technical product sales and 45 account for 70 percent. The 10 largest firms are estimated to be responsible for 75 percent of production.⁷ The significance of this is addressed by an EPA report:

This means that the industry is quite highly concentrated or "oligopolistic." The structure being not highly competitive means that individual firms have significant shares of the market and are capable of influencing market parameters such as quantity, quality, and price of production.⁸

Business is usually good in the industry. One study indicates that profits are high because of such factors as strong patent protection, significant barriers to new entrants, concentration of sales among a few dominant manufacturers and market fragmentation into many sub-markets. This study describes the industry as one with "extraordinary profitability" and one in which, "the most important determinant of marketing success is the R & D capability of a firm."⁹ A March 1980 report written under contract to the Congressional Office of Technology Assessment describes the economic health of the major producers:

Pesticide manufacturing is the most intensely regulated sector of the chemical industry, with the exception of drugs. But R & D investment in pesticides has increased significantly, the increase in the number of new patents obtained for pesticides in recent years is greater than for any other part of the chemical industry, sales of pesticides have soared, and at least for some companies, pesticide sales bring in higher profits than sales of other types of chemicals.¹⁰

Although information on the production and use of pesticides is somewhat unreliable, some estimates do exist.¹¹ In 1978 annual pesticide production in the United States was estimated to be about 1.416 billion pounds with a value of about 3.34 billion dollars.¹² Exports in that year amounted to approximately 677 million pounds.¹³ Imports in 1978 totaled 74 million pounds.¹⁴ One estimate is that about 55 percent of the pesticides sold in this country are used in agriculture, 30 percent in industrial, institutional and governmental use, and 15 percent in home and garden use.¹⁵

Because agriculture comprises the largest user segment much of the discussion of pesticides in this dissertation will focus on these chemicals as used on the farm. The three crops on which pesticides are used the most are corn, soybeans, and cotton. In 1978, these three crops accounted for 63 percent of all farm pesticide purchases.¹⁶ Figuring the percentages on the basis of weight, in 1976 herbicides comprised 58 percent of the pesticides used on farms. They were followed by insecticides (24 percent); fumigants, growth regulators, dessicants, and defoliants (9 percent); and fungicides (7 percent).¹⁷

In 1978 an estimated 8.67 billion dollars was spent for pesticides worldwide. In that year the United States accounted for one-third of all the pesticides used in the world. This country manufactures about 40 percent of the dollar value of these chemicals.¹⁸

What This Dissertation Will Do

This dissertation will define what "adequate" regulation of pesticides would be. It will do this by establishing several criteria which would have to be met for regulation to be adequate. It will be argued that regulation does not conform to these criteria. The reasons why it does not will be analyzed. This will require an examination of the roles of the major participants in the pesticide policy process including the industry groups, the environmentalists, the EPA and Congress. It will also require an examination of some of the scientific bases of pesticide policy. The pesticide issue involves much scientific input and in order to analyze it, it is necessary to look not only at the dynamics of the normal regulatory and political processes, but also at the processes

influencing the generation of scientific information relative to this issue. In particular, with regard to the effects of pesticides on human health, it will be argued that the generation of scientific information is itself a political process which is characterized by strong economic influences on what types of questions are asked and answered. In order to understand the pesticide issue one must understand the politics of pesticide related science, who the most powerful actors are, and how these actors affect the scientific information which forms an essential input into the more visible arenas of pesticide regulation such as the EPA or Congress.

This chapter will provide an introduction to the pesticide policy issue and an explanation of how the issue will be analyzed and evaluated. The second chapter will describe some of the harmful effects of pesticides in order to emphasize the importance of adequate regulation. A definition of "adequate" regulation will then be set forth. This definition, which will be based on several criteria, will offer a basis for evaluation when examining this policy issue.

Chapter III will offer a history of pesticide regulation. It will focus on the period from October 1972 to December 1980, but in order to understand the events which occurred during this time, at least some knowledge of the years from the earliest federal regulation (1910) to 1972 is necessary. Consequently this chapter will also outline the most significant events of this earlier time. In describing the history of pesticide regulation this chapter will point out the tendencies of Congress, since 1972, to weaken the law, and to ignore much easily accessible information.

Chapter IV will focus on the Congress. The participants in the Congressional politics of this issue will be described and their relative influence explained. This will be followed by a description of the roles of several Congressional committees. The rest of the chapter will offer an explanation and criticism of how Congress goes about weakening the law regulating pesticides. It will describe and criticize the types of explanations most often offered by legislators for their actions. It will examine the tendency of legislators to describe their decisions, which are essentially political in nature, in

scientific terms thus portraying them as the results of careful consideration of scientific evidence. Information will be presented which indicates that in fact legislators tend to ignore much evidence concerning the harmful effects of pesticides and the need for stricter regulation. The dissertation will also describe the tendency of Congress to weaken the pesticide law through many small changes which have the effect of either weakening the law as a direct result of the change, or by making it more complex and difficult to administer. Finally, it will explain the tendency of Congress to discourage the EPA from rigorously enforcing the law.

The next three chapters will deal with the relation of the pesticide regulatory process to science. It is difficult to overemphasize the importance of science to this issue. Administrators make many regulatory decisions on the basis of scientific input. Legislators are also influenced by science. Some use it in making decisions concerning the revision of legislation. Others use it as a justification for decisions which appear to be based primarily on political considerations. Chapter V will begin with an explanation that the economic relation of the

pesticide industry to the scientific infrastructure which produces information concerning the risks to human health and benefits of pesticides is so structured that this infrastructure does not provide as objective an assessment of the effects of these chemicals as it would under an alternative set of conditions. This chapter will explain that evidence to support this contention will be offered by describing three aspects of pesticide related science:

- 1) The testing of pesticides for registration
- 2) The relation of the pesticide industry to agricultural science in the universities and
- 3) The relation of the industry to cancer testing.

The greatest part of this chapter will explain the requirements for the testing of pesticides. It will present evidence to support the contention that the industry (which does its own testing) has often reported inaccurate results. It will also be argued that the EPA has failed to adequately audit industry test data. The central argument made in this chapter is that the present law, which allows the industry to do its own testing, is likely to produce test results which tend to be biased in favor of the interests of the industry.

In chapter VI we will look at the relation between the pesticide industry and the agricultural sciences in the nation's universities. In particular this chapter will look at the entomology profession and at a group of agricultural scientists known as the Council for Agricultural Science and Technology (CAST).

Many pesticides are suspected of causing cancer. Thus two important scientific questions related to the pesticide issue are whether or not specific pesticides are carcinogenic (cancer causing) and, if they are, the strength of their carcinogenic effect. Chapter VII will look at conflicting theories concerning how cancer is caused by chemicals and what tests constitute acceptable proof of carcinogenicity. Some of these theories tend to support the arguments about regulation most often made by industry people and some tend to support the environmentalist's arguments. This chapter will argue that the theories which tend to support industry arguments tend to be transmitted to the public and legislative decisionmakers more frequently than environmental ones. It will explain how the industry promotes its theoretical perspective in the press and in communication

with legislative decisionmakers, and it will point out that often this perspective is presented as if it were fact rather than opinion.

The concluding chapter will summarize the arguments which have been made and will relate these arguments to some of the theoretical observations which have been set forth by other analysts. The chapter will also discuss some possible practical steps which might provide a solution to the problem of regulating these chemicals, but it will argue that these steps could never be implemented within the present framework of American political and ecological consciousness. The reasons why they could not be implemented will be explained and the needed changes in political and ecological perspectives will be discussed.

FIFRA, Congress and the EPA. The dissertation will focus on the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). This law is the primary legislation on which the federal regulation of pesticides is based. There is other legislation covering minor aspects of the use of these chemicals which will be described, but FIFRA is the major

law covering pesticide use and this analysis will concentrate on FIFRA. We will examine the role of Congress in revising and overseeing this legislation and the role of the EPA in enforcing it. FIFRA was first passed in 1947. In October, 1972 the law was so thoroughly revised that it was, in effect, a completely new law. Further changes occurred in 1975, 1978 and 1980. Some of the changes made in these years since 1972 have been quite significant, but they have not changed the basic nature of the 1972 law. Although the 1972 law would not meet our criteria for regulation, it did allow for considerably more control of pesticides than had previous legislation. The 1972 FIFRA has been the basis for the EPA's regulation of pesticides (the EPA took over this responsibility from the USDA in 1970). In 1972 with a new pesticide law and a new agency having taken over the regulatory function, many thought that the regulation of pesticides would be much improved. The new law and the previous assignment of enforcement responsibility to the EPA were hailed as effective ways in which to correct the abuses of previous years. The dissertation will focus primarily on the period from October, 1972 to December 31,

1980 in order to evaluate the extent to which these aspirations have been met and, to the extent that they have not been met, in order to analyze the reasons why.

The EPA is the federal agency with the primary enforcement authority for FIFRA. Before a pesticide can be sold it must be registered by this agency. The registration of pesticides is a major responsibility of the EPA which takes up much of its resources. Setting tolerances also requires a significant portion of EPA attention. The responsibility for enforcement of the rules concerning pesticide use by consumers is shouldered, for the most part, by the states. Although the roles of the FDA and the states will be discussed, the primary administrative agency focused on will be the EPA.

In analyzing the regulation of pesticides, the conceptual approach employed will not draw a sharp distinction between the administration of the pesticide law by the EPA and the revision of the law by the Congress. This is because of the close relationship of the two processes. Congress is closely involved in the regulatory process through informal communications with EPA personnel and through questions in frequent hearings which

hold officials accountable for their actions. When the law is strongly enforced by the EPA, revisions of the law which tend to weaken it are often threatened and sometimes passed by Congress. Thus a sharp distinction between administration and legislation is a less useful way of conceptualizing the process which is taking place.

What This Dissertation Will Not Do

It should be mentioned what this dissertation will not do. There are many aspects of the pesticide issue which it will not be possible to examine in detail. One example is the section of the Federal Food, Drug and Cosmetic Act which regulates the amount of pesticide residues permitted on food. This law, which is enforced by the FDA, will be described, but it will not be analyzed in detail. Another very important aspect which will not be treated in detail is the regulation of the exposure of farmworkers to pesticides. Some of the most serious effects of these chemicals are experienced by farm laborers. The problem of worker exposure has been the subject of various reports, studies, and congress-

ional committee hearings. However there are many who would argue that this problem has not received nearly the amount of attention that it deserves. Another problem with its own set of technical and political questions is the exposure of pesticide workers in factories. Another is the increasing conflict between farmers spraying pesticides and their neighbors who are exposed to pesticide spray drift. This problem has grown in recent years as a result of the development of housing in rural areas, and as this trend continues, it is likely to become an even more serious problem.¹⁹ A related problem is the exposure of urban populations to spraying aimed at controlling agricultural pests. The classic example of this is the divisive California fruit fly issue. All of the problems just mentioned are important, but the aim of this dissertation is to attain an understanding of the overall process of the federal regulation of pesticides. Thus these problems will not be analyzed in detail. Some of them will be mentioned as they relate to the observations being made, however a detailed analysis of each one is not the purpose of this work.

Policy Analysis and Values

This dissertation will analyze the pesticide issue in as objective a manner as possible. It will attempt to discern the true nature of the process under study; however no large collection of data can be given order and meaning without the imposition of values. The same collection of data could be interpreted in several different ways depending on the values of the observer. To argue that only one interpretation of a political issue is the correct, objective one is to argue that human nature, the basis of political activity, is perfectly understood.

The person who has carefully thought about the nature and logical consistency of his values and who is thus more conscious of what these values are, is more likely to realize the effect which they have on his conceptualization of policy processes. Likewise the reader who has at least some idea of the author's values can better understand the philosophical basis of the arguments made.

Thus it is appropriate to make clear the writer's

assumptions. This author believes that long term economic and social stability can only be maintained by preserving the physical environment in which the economy and society functions. For example farming can only be a prosperous activity in the long term if the soil is properly maintained. It can be argued that several modern farming methods tend to deliver high short term profits while reducing the ability of the farm ecological system to produce food, and thus profits, in the long term.²⁰ Another example is the pollution of ground water from toxic wastes buried in the ground. This type of problem, of which the Love Canal is the classic example, is likely to produce social instability in the form of conflict between polluters and those identifying with them on the one hand, and those who suffer the effects of pollution and those who support their interests on the other.

The author's perspective sees the resources of the earth as being limited. On the basis of this realization it is considered prudent to place more emphasis on the need to look at the long term needs of society (considered in a global sense) and to match these needs

to resources. While resources are limited, the complexity of nature is seen as being almost without limits. Because nature is so complex, it is extremely difficult to gain complete knowledge of the effects of technology on the environment. The complexity of nature is not easily reproducible in the laboratory where controlled experimentation can take place. Due to this difficulty in understanding the effects of technology, the wisest course is to tend to be cautious with new technological innovations which may have an adverse effect on the environment. Such technology should be carefully studied before being introduced at all and if its possible effects are still uncertain, but there is a strong need for it, it should be introduced slowly and carefully. If this is done it is more likely that if a harmful effect is found it will cause less damage and be controlled more easily than it would if the technology had been introduced on a wide scale. This is not at all an anti-technological perspective. It is a pro-technological perspective which advocates the development of ecologically sound technologies and caution in introducing potentially harmful innovations.

The author believes that there is much which is not known about fundamental ecological processes and the possible harm caused by polluting technologies. It is believed that not enough is being done to understand these questions or to control the harmful effects of pollution which are understood. The Reagan Administration has significantly reduced the amount of environmental regulation, but even in recent years when this regulation was at its height, not enough attention was being paid to the environment. The author believes that a sound environment can only be achieved by making greater efforts at understanding the effects of technology and controlling its harmful effects. Controlling its effects will sometimes require the replacement of some technologies by others which are less inherently polluting.²¹

It is important to reiterate that all this is not an anti-technological argument (as the critics of the environmentalists are likely to argue). It is, in fact, an argument for the development of more information about the effects of technology and for the wise use of technology based on this information. It is an argument for the development and careful innovation of new technology,

technology which is, as far as possible, unpolluting and inherently compatible with nature, technology such as solar power, organic farming, and integrated pest management.

The ideas just discussed will never become a reality unless the public has a significant understanding of environmental problems. There must be a greater consciousness throughout society of the nature and importance of ecological processes and the potential effects of pollutants on these processes. This knowledge must include an understanding that some ecological issues are not just matters of aesthetics or health. There must be a realization that some ecological issues may be related to the long term survival of the human species or at least to potential catastrophes which if they did not end all human life would seriously affect the entire world. An example described by author Amory Lovins is the problem of nuclear power for energy and the associated problem of potential proliferation of nuclear weapons manufactured using material from nuclear reactors.²² The public is not likely to support legislation which provides strong environmental protection unless it has been educated

about the nature and potential seriousness of environmental problems.

The small progress which has been made in controlling pollution has involved significant costs such as the equipment needed to clean smoke stack emissions or the catalytic converters used to clean automobile exhausts. It is likely that future efforts aimed at providing substantial protection of the environment will be even more costly. It does not seem probable that under the present set of social and economic arrangements predominating in America there will be much support for these measures. Throughout American culture there is a strong ethic of individualism. It is the author's opinion that while a certain amount of individualism is desirable, the excessive manifestation of this trait which characterizes American culture precludes the amount of cooperation necessary to share the burdens associated with significant environmental improvement. Excessive individualism is rooted in an economic system which stresses competition rather than cooperation. As authors William Connolly and Michael Best argue in their book, The Politicized Economy, there is no internalized "we"

with which many people naturally identify.²³ Because there is no internalized "we" there is little willingness to make the sacrifices needed to assure the welfare of society. Thus it is the author's assumption that in addition to a need for an effort to change the public's consciousness of environmental problems through an educational effort, the solution of environmental problems will also require the development of alternative forms of economic and political organization, forms which tend to encourage and reenforce the development of cooperative attitudes while discouraging excessive individualism.

Sources

The source material for this dissertation includes government documents, books, articles, and interviews. Particularly useful among the government documents were the several General Accounting Office reports which criticize the EPA's handling of the pesticide problem. Also useful were the records of the congressional hearings which have been held on the matter.

Interviews were conducted with congressmen who are members of the House Agriculture Committee, Agriculture Committee staff members, other congressional staff, EPA officials, environmentalists and chemical industry representatives. In general the interviews tended to provide a useful confirmation and elaboration of the positions already taken by the various parties in the written record of the pesticide policy process, that is the many books, reports, records of congressional hearings, and newspaper, magazine and journal articles. The interviews also provided some information in addition to the written record, but most of the information, opinions, and ideas were already in the record. This fact deserves comment. The positions of legislators and their staff seem to be the results of careful deliberation. To add much to their previously stated positions is to risk going out on a limb and possibly offending either industry, farm or environmental groups. The same is true for EPA staffers most of whom seemed sincerely interested in providing useful answers while avoiding controversies which might make their already difficult jobs even more complex. The industry people

interviewed were representatives of a trade association. Their positions are the result of negotiations within their association and it seems unlikely that a representative would be interested in adding too much to the official position of his association, and thus risk provoking reactions from association members who do not agree with him. Of those interviewed the environmentalists seemed to be the most candid and willing to volunteer information.

In general all those interviewed impressed the interviewer as being sincere and honest. However interviewing the participants in a public policy forming process is different from interviewing other subjects such as, for example, working class Americans in a study of their attitudes. In the latter case interviewers tend to provide spontaneous and very candid answers. This may be because they believe that their answers are not likely to lead to any reprisals against them. For those group leaders who form pesticide policy, however, there must exist at least a subconscious realization that the wrong answer is likely to offend some important

political actors. Given this realization, answers are, inevitably, carefully framed and somewhat cautious.

The literature on pesticides. The literature on pesticides is quite extensive, however the following paragraphs provide a description of some of the most significant works.

The most important book written on the pesticide problem is probably Rachel Carson's Silent Spring which was first published in 1962. This book not only focused attention on pesticides, but also contributed significantly to the emergence of "the environment" as a political issue. Robert L. Rudd's Pesticides and the Living Landscape (1964) and Kenneth Mellanby's Pesticides and Pollution (1969) followed Carson's book.

J. C. Headly and J. N. Lewis analyzed pesticide policy from an economic perspective in their book The Pesticide Problem: An Economic Approach to Public Policy (1967).

Frank Graham focused almost entirely on the political aspect of the pesticide issue in Since Silent Spring (1970). In Unfit for Human Consumption (1971) Ruth

Mulvey Harmer criticized pesticide regulators and the pesticide industry while also discussing biologically sound ways to control pests. The problems of pesticides in food and government regulations concerning them were examined by Harrison Wellford in his Sowing the Wind (1972). Politics and Pesticides (1975) by Laura Tallian described the harmful effects of these chemicals and suggested ways in which political action might bring about change.

More recent books include V. G. Dethier's Man's Plague? (1976) in which the author suggests that indiscriminate use of pesticides may facilitate the comparatively rapid evolution of insects who are resistant to them. An excellent outline of the harmful effects of pesticides is provided in Samuel S. Epstein's The Politics of Cancer (1978). Although the author never proves the assumption stated in its title, The Pesticide Conspiracy (1978) by Robert van den Bosch provides insight into how political pressure is exerted by pesticide manufacturers. Malignant Neglect (1979) by Robert H. Boyle and others discusses several environmental factors associated with cancer. The book includes a chapter on

pesticides in which the authors describe the lengthy regulatory proceedings required to ban the pesticide aldrin/dieldrin. In their book Pest Control: Cultural and Environmental Aspects (1980) editors David Pimentel and John H. Perkins present several articles by a collection of sociologists, economists, lawyers, ecologists, science policy analysts, and pest control scientists who examine the social, economic, political, and ethical factors which influence the development of pest management systems. Authors David Weir and Mark Shapiro focus on the international aspects of pesticide regulation in their Circle of Poison (1981).

The history of pesticide use in America beginning in the nineteenth century is described in James Whorton's Before Silent Spring: Pesticides and Public Health in Pre DDT America (1975). More recent histories are provided in William Hazelton's The Legislative History and Meaning of the Federal Insecticide, Fungicide and Rodenticide Act As Amended, 1972 (1975), and in John E. Blodgett's article "Pesticides: Regulation of An Evolving Technology" (1974).²⁴ In his book DDT: Scientists, Citizens and Public Policy (1981), Thomas R.

Dunlap attempts to put the controversy over DDT in historical perspective.

Several books present arguments against the environmentalist perspective on the use of pesticides. Among the most important of these are Bugs or People? (1975) by Wheeler McMillen, That We May Live (1966) by Congressman Jamie Whitten, The DDT Myth (1973) by Rita Gray Beatty, The Pest War (1974) by W. W. Fletcher, and Pesticides - Boon or Bane (1976) by M. B. Green.

There are many books which focus on the scientific aspects of the issue. Robert L. Rudd's Environmental Toxicology: A Guide to Information Sources (1977) provides a useful starting point for research. Understanding of the scientific dimension of pesticide pollution can be obtained from D. L. Gunn and J. G. R. Steven's Pesticides and Human Welfare (1976), and Rizwanul Hague and V. H. Freed's Environmental Dynamics of Pesticides (1975). In addition to the book mentioned above, the entomologist, David Pimentel, has written and edited several good books among them: Pest Control Strategies (1978) with Edward H. Smith, World Food, Pest Losses and the Environment (1978), and Pesticides: Contemporary Roles In

Agriculture, Energy and the Environment (1979) with T. G. Sheets. An explanation of the difficulties of proving that a substance is carcinogenic can be found in H. F. Kraybill and Myron A. Mehlman eds. Advances in Modern Toxicology Volume 3. Environmental Cancer. In his The Pesticide Book (1978), George W. Ware provides an extensive description of the types of pesticides available and their uses.

There have been several important studies of the pesticide problem by scientific committees. A study in 1963 by the President's Science Advisory Committee (Use of Pesticides) focused on the inadequacy of regulation. In 1969, a Department of Health, Education and Welfare study looked at the environmental effects of pest control chemicals (Report of the Secretary's Commission on Pesticides and their Relationship to Environmental Health). The National Academy of Sciences has produced several studies. The most important of these are: Pest Control: An Assessment of Present and Alternative Technologies (1975), Pesticide Decision-making (1978), and Regulating Pesticides (1980).

This chapter has introduced the reader to the subject of the federal regulation of pesticides. It has described what this dissertation will do and how it will be done. It has explained the author's value perspective and it has described the most significant literature related to the subject of pesticide regulation. We move now to the effects of pesticides and some criteria for regulation.

NOTES TO CHAPTER I

¹

"Chemicals Add to Disease Burden For Nation; Surgeon General Says," New York Times, 13 September 1980, p. 32.

²

Eugene B. Skolnikoff, "The Governability of Complexity," in Growth In America, ed. Chester L. Cooper (Westport, Connecticut: Greenwood Press, 1976) p. 84.

³

This definition is based on I. D. Farquharson, "Pesticides: A Guide To Terminology," in Pesticides and Human Welfare, eds. D. L. Gunn and J. G. R. Stevens (Oxford: Oxford University Press, 1976), pp. 257-259.

⁴

Abstract of Pesticides In Perspective: Some Ecological Aspects of Their Uses In Agriculture and Public Policy, by N. O. Crossland, in Proceedings of the Royal Society of Medicine 69(August 1976): 563-564.

⁵

William F. Durham, "Pesticides and Human Health" in Pesticides: Contemporary Roles in Agriculture, Energy and the Environment, eds. T. J. Sheets and David Pimentel (Clifton, New Jersey: The Humana Press, 1979), p. 84.

⁶

This paragraph is based on: U.S., Congress, Senate, Committee on Agriculture, Nutrition, and Forestry, Federal Pesticide Act of 1978, Committee Print (Washington, D.C.: Government Printing Office, 1979), p. 194; U.S., Congress, Senate, Committee on Agriculture, Nutrition, and Forestry, Extension of the Federal Insecticide, Fungicide, and Rodenticide Act S. Rept. 334 to Accompany S. 1678, 95th Cong., 1st sess., 1977, pp. 27-31; and Lawrence Fishbein, "Overview of Potential Mutagenic Problems Posed By Some Pesticides and Their Trace Impurities," Environmental Health Perspectives 27(December 1978): 125.

⁷ U.S., Congress, Senate, "Extension," p. 60.

⁸ Ibid.

⁹ Ibid., p. 63.

¹⁰ The report is referred to in U.S., Congress, House, Subcommittee on Department Investigations, Oversight, and Research of the Committee on Agriculture, Extension of the Federal Insecticide, Fungicide, and Rodenticide Act. Hearings. 96th Cong., 2d sess., 1980, p. 150.

¹¹ U.S., Congress, Senate, Committee on Environment and Public Works, Environmental Protection Affairs of the Ninety-Fifth Congress, Committee Print, A Report Prepared By the Congressional Research Service of the Library of Congress (Washington, D.C.: Government Printing Office, 1979), p. 214; One reason why information is unreliable is that in its surveys of pesticide data, the government can publish figures for production, domestic sales, exports, and imports for an individual pesticide only if it is manufactured by a sufficient number of producers so that industry totals do not reveal individual company data. See U.S., Department of Agriculture, Agricultural Stabilization and conservation Service, The Pesticide Review 1978, by D. Lee Fowler and John N. Mahan (Washington, D.C.: Government Printing Office, 1980), p. v.

¹² U.S., Department of Agriculture, pp. 1, 3.

¹³ Ibid., p. 1.

¹⁴ Ibid.

¹⁵ U.S., Comptroller General, Environmental Protection Issues Facing the Nation (Washington, D.C.: Government Printing Office, 1979), p. 38; Another estimate is that farmers account for about two-thirds of pesticide industry sales. See U.S., Department of Agriculture, Economics, Statistics, and Cooperative Service, The Farm Pesticide Industry, by Theodore R. Eickers, Agricultural Economic Report No. 461 (Washington, D.C.: Government Printing Office, 1980), p. 1.

16

U.S., Department of Agriculture, Economics, Statistics and Cooperatives Service, Evaluation of Pesticide Supplies and Demand For 1980, by Theodore R. Eickers, Agricultural Economic Report No. 454 (Washington, D.C.: Government Printing Office, 1980), p. 5.

17

R. L. Ridgway et al., "Pesticide Use In Agriculture," Environmental Health Perspectives 27 (December 1978): 106.

18

U.S., Department of Agriculture, Evaluation of Pesticide Supplies and Demand, p. 14.

19

At least one high EPA official believes that this will be one of the primary pesticide related issues of the next few years. Interview with an EPA official held at EPA Headquarters in Washington, D.C. on an off-the-record basis in June, 1981.

20

Statement to the Senate Subcommittee on Administrative Practice and Procedure, October 19, 1977 by Organic Gardening and Farming Research Center, Rodale Press, Emmaus, Pennsylvania, Richard Harwood Ph.D., Director in U.S., Congress, Senate, Subcommittee on Administrative Practice and Procedure of the Committee on the Judiciary, Priorities In Agricultural Research of the U.S. Department of Agriculture. Part II. Appendix. 95th Cong., 1st sess., 1977, pp. 24-33.

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22

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Michael H. Best and William E. Connolly, The Politicized Economy (Lexington, Massachusetts: D.C. Heath and Company, 1976), p. 119.

24

Blodgett's article is in The Legislation of Product Safety, Volume 2. Consumer Health and Product Hazards - Cosmetics and Drugs, Pesticides, Food Additives, eds. Samuel S. Epstein and Richard D. Grundy (Cambridge, Massachusetts: The MIT Press, 1974), pp. 197-287.

C H A P T E R I I

PESTICIDES: THEIR EFFECTS AND SOME CRITERIA FOR REGULATION

Why is it so important to regulate pesticides and how should they be regulated? This chapter will provide answers to these questions by looking at the effects of these chemicals on humans, wildlife, and the farm environment, and by establishing some criteria with which to judge regulatory efforts.

Effects of Pesticides

In the following pages we will outline the effects on humans and wildlife of the pesticide use patterns which are now permitted by the present law. The criteria for pesticide regulation to be proposed later in this chapter would greatly reduce these harmful effects by greatly reducing the use of all pesticides and by possibly eliminating the use of the more dangerous ones.

In discussing the effects of pesticides, it would be nice to present some hard data; to say, for example, that cancer deaths resulting from the use of pesticides are now "X" number and that the number would be reduced by 97% if our criteria of regulation were met. There are, however, insufficient data to do this. No one knows how much cancer pesticides cause and figures describing how many people become sick from pesticide poisoning are merely estimates. We can only say that regulations which led to decreased use of pesticides would reduce their harmful effects.

Three types of effects will be described. These are: toxic effects on humans, effects on the environment, and effects on target pests and their natural insect enemies. Although carcinogenic and mutagenic effects fall under the rubric of toxic effects on humans, they will be discussed in a separate section due to their importance and complicated nature.

Toxic effects. The World Health Organization has estimated that, worldwide, there are 500,000 cases of pesticide poisoning a year with a fatality rate of one

percent.¹ The data concerning the number of pesticide poisonings in the United States are unreliable. While some states collect data on the amount of pesticide poisonings, others do not.² Estimates of deaths and injury caused by pesticides in this country vary considerably. Estimates of deaths caused annually vary from 35 to 200.³ One estimate of the number of pesticide poisonings requiring medical attention each year is 1500.⁴ Another estimate is 6,000.⁵ The EPA has estimated that there are about 14,000 cases of pesticide poisoning in the United States a year, but the incompleteness of this figure is indicated by the estimate of the California Department of Food and Agriculture that in California alone there are about 14,000 cases a year of personal exposure to pesticides involving requests for assistance.⁶ Furthermore, it is claimed that there is much more illness than is treated and that only a very low percentage of pesticide related illness in field workers is reported.⁷ One estimate is that there are over 100,000 cases a year in California of illness related to pesticide exposure.⁸ A representative of a public interest group which is concerned with the health effects

of pesticides on farm workers reported to the author that for many workers the vomiting and other effects of pesticides are accepted as inevitable, as part of the job.⁹

The effects of pesticides are manifested through several channels and, because they are exposed to higher levels, some occupational groups experience these effects more than do members of the general public. Prevalent among the victims of pesticide poisoning are farm workers. Factory workers are also sometimes involved. Public exposure, while not as serious as the risk to specific occupational groups, is also extensive. Long term exposure to relatively low levels of pesticides occurs through the ingestion of food containing pesticide residues, through use in the home, and through neighborhood or area spraying programs.¹⁰ A growing problem is the drift of pesticides sprayed on farmers' fields onto adjacent housing developments.¹¹ Another problem is the contamination of drinking water supplies by pesticides which have seeped into water tables after having been sprayed on farmers' fields. An example of this is the contamination of private wells on Long Island by the pesticide Temik.¹²

Although everyone is exposed to at least some level of pesticides, there are indications that the burden of exposure is not equally shared. Evidence suggests that Blacks and the poor have higher levels of pesticide residues in their bodies than the rest of the population.¹³ The author of one article on this subject suggests that this is related to routes of exposure other than food.¹⁴

There are several ways in which pesticides may harm humans. Serious damage is easy to diagnose, but some effects are subtle and the fact that pesticides are causing them may not be realized. There may be chronic damage to the nervous system. Even tiny amounts of pesticides can alter brain activity for more than a year and cause irritability, insomnia, loss of libido and reduced powers of recall and concentration.¹⁵

Carcinogenicity, mutagenicity, and teratogenicity. Many pesticides are believed to be carcinogenic, mutagenic or teratogenic. These terms refer to the ability of a substance to cause cancer, mutations, or birth defects. One estimate is that of the approximately 1500 active ingredients in pesticides, approximately one fourth are

mutagenic and carcinogenic.¹⁶ Author Lawrence Fishbein in an article in the journal Environmental Health Perspective has warned that the possible mutagenic effects of pesticides could threaten the genetic health of future generations.¹⁷

One of the most controversial issues related to pesticide regulatory policy is the potential of these chemicals to cause cancer. Probably no other aspect of this policy area is the subject of so much debate. There is much disagreement concerning which pesticides cause cancer and how to establish a causal link between a chemical and cancer. The scientific standards of proof are different for environmentalists and the pesticide industry. Furthermore, there is disagreement concerning how much exposure to carcinogens is safe. Many scientists argue that any exposure to a carcinogen, no matter how small the amount, is associated with at least some risk of cancer. Others argue that exposure to carcinogens in concentrations below a "threshold" means no risk of cancer. There are many other aspects of this debate. It is an extremely complicated controversy and it is so

important an aspect of this issue that a later chapter has been devoted entirely to it.

The tendency of very small amounts of pesticides to cause cancer is seen by many as being their most dangerous property. This is because everyone is exposed to small residues of these chemicals on the food they eat. If those who claim that many pesticides are an important cause of cancer in humans are correct, then the number of deaths caused by these products may far exceed the estimates previously mentioned.

The pesticide residues on food are comparatively small and cannot exceed a "tolerance" level which is set by the Environmental Protection Agency (EPA) for each type of crop. Some believe that residues have remained within safe limits. Others claim that little is known about the long term effects which low-level dosages of pesticides may have on public health.¹⁸ Furthermore, the possible interaction between low level dosages of pesticides and the numerous drug and food additives which the public consumes has not been completely studied.¹⁹

After the EPA has set a tolerance for the amount of pesticide residue permitted on a food crop, this

regulation is then enforced by the Department of Agriculture for meat and poultry, and the Food and Drug Administration for most other food products. The EPA sets its tolerances on the basis of tests which it requires the producers of pesticides to submit. The tolerances are set at a level which is presumably safe, but whether or not one accepts them as being safe depends on one's theory of cancer causation.

Assuming for the moment that the tolerances are safe, there are still problems with their administration. A 1978 report of the House Committee on Interstate and Foreign Commerce noted that the EPA tolerance setting program was poorly administered.²⁰ This criticism has also been the theme of other reports.²¹ An example of its poor administration is the fact that the EPA has established tolerances for chemicals without waiting for submission from the manufacturers of all the testing data needed to substantiate them.²²

In addition to problems with EPA tolerance setting there are difficulties with FDA and USDA enforcement. In Congressional hearings in 1978, it was noted that 195 of the 268 pesticides with tolerances were seldom if

ever monitored.²³ A 1979 General Accounting Office (GAO) report indicated that although the USDA reported that only 2 percent of the meat it inspected contained illegal residues, the real amount was closer to 14 percent.²⁴

Environmental effects. The use of pesticides causes considerable ecological damage. This damage results in a degraded environment and sometimes in economic damage. For example about 20 million dollars worth of bees are destroyed yearly by pesticides.²⁵ Bees are important not only as a source of honey, but also as a means of pollination. Without the domestication of honey bees by professional beekeepers, foods such as cherries, avocados, tangerines, apricots, and almonds could not be produced on a large scale. Honeybee pollination is also required for the production of most vegetable seeds: broccoli, cauliflower, cucumbers, eggplant, celery, and onions, as well as clover and alfalfa which are among the major constituents of feed for beef cattle, poultry, and dairy animals.²⁶

There is much evidence to substantiate the concern that current methods of pesticide use are an important

hazard to flora and fauna.²⁷ Often birds and fish suffer the worst effects. In 1974 virtually all of the brown pelicans along the Gulf coast of Louisiana were killed by the pesticide "endrin" which was flushed by floodwaters into the Gulf of Mexico from Louisiana's cotton fields.²⁸ Another example of pesticide related wildlife damage is the decline of lake trout in Lake George in New York.²⁹

Effects on insect resistance and natural enemies. The indiscriminate use of insecticides to control insect pests may actually lead to increased losses to these pests. This is because of insect resistance and the destruction of natural predators and parasites. Insects tend to develop resistance to insecticide chemicals and the same chemical which kills harmful pests may also destroy those natural predators and parasites of the insect pest which normally keep its numbers under control.

The seriousness of these problems has been pointed out in a report of the National Academy of Sciences:

. . . we have come to recognize that the induction of genetic resistance in pest species and the disruption of natural control mechanisms constitute rising threats to the continued success of our current control technologies. We believe these problems will become more acute, because we predict that incentives for increasing agricultural production will continue over the next decade. . . . we contend that the problems of genetic resistance and disruption of natural control, lying entirely within the enterprises of agriculture, forestry, and public health, warrant substantial expansion of present efforts to promote alternative technologies, including integrated control strategies.³⁰

When a pesticide is used many insects are killed.

Some, however, may survive because they possess a certain trait in their genetic makeup which makes them less susceptible to the insecticide.³¹ This trait varies with different insects and chemicals. Often it is a biochemical capacity to metabolize the pesticide so that it is converted into nontoxic products.³² It may also involve the sensibility of critical target enzymes, or the permeability of the insect or its internal organs.³³

Another mechanism of resistance is diversity in behavioral mechanisms which may affect the contact of the insect with the chemical.³⁴ With respect to one or all of these traits, there is apt to be considerable diversity among natural populations of pests.³⁵ With

repeated exposure to pesticides, those individuals possessing one or more of these traits tend to survive while others are killed. Because insects reproduce at a comparatively rapid rate, it may not be long before an insect population with resistance to a chemical evolves. Often the biochemical modifications involved in the evolution of resistance have fairly wide applicability. For this reason it is often found that a species has become resistant to a chemical other than the one to which it has been exposed.³⁶

Of course not all insects have developed resistance but the extent of the problem is quite significant. One entomologist points out that resistance is the main obstacle to successful pest control.³⁷ The problem exists not only in insects, but also in rodents, fungi, weeds and bacteria; however the most serious aspect of resistance, and the one concentrated on here, concerns insects.³⁸ There are many insect species which have developed resistance and nearly every species is potentially capable of becoming resistant to any kind of insecticide.³⁹ A world survey indicates that there are 364 species of insects and mites which have developed

resistance to chemical pesticides.⁴⁰ Of these, 304 have been confirmed by laboratory tests.⁴¹

There are many insects which are natural predators or parasites of insect pests but which are relatively harmless to crops. In a diverse, stable ecological system these natural enemies tend to keep the numbers of insect pests down, however many pesticides which are applied to control insect pests also kill large numbers of natural enemies. This is because most of the chemicals which dominate the pesticide market have a broad spectrum of toxicity.⁴² Sometimes the use of chemicals depletes the numbers of pests to such low levels that natural enemies move on to other areas to search for food.

Of course if insect pests can become resistant to pesticides, why can not natural enemies? Beneficial species do become resistant, but it seems that they do not do so at the same rate as their prey.⁴³ One possible reason is that pest populations are normally larger than their predators and thus more likely to include any given rare genotype necessary for the development of resistance.⁴⁴

A typical scenario is that of a farmer using pesticides and resistance beginning to develop. As resistance develops among the pest population, it begins to grow, this time unhampered by natural enemies. The result is that after several months of spraying, the farmer may well be faced with higher numbers of pests than he originally encountered. In order to control the increased levels of pests, he applies more pesticides. This leads to more genetic resistance and more destruction of enemies and thus the use of more pesticides, or, as van den Bosch describes it, an "insecticide treadmill."⁴⁵ After natural enemies have been killed off, it is sometimes the case that organisms which had existed at such low population levels that they had not previously been pests, increase to the extent that they become serious pests.⁴⁶ Thus the farmer may find that the result of excessive pesticide use has been an increased level of pests which are now more difficult to control because of resistance and a lack of natural control mechanisms. This increased level of pests may not only include greater numbers of the original pest species, but also new species which had not previously existed at high

enough levels to be considered pests.

A classic example of the effects of insect resistance and the destruction of natural enemies is the Canete Valley of Peru.⁴⁷ This is one of many coastal valleys in Peru. Cotton yields ranged from 415 to 526 pounds of lint per acre in the years immediately preceding the development of the synthetic organic pesticides. Soon the organic insecticides, primarily DDT, BHC and toxaphane, were being used heavily while improved cultural practices were also adopted in order to increase yield. Yields went up to over 600 pounds per acre, however many growers assumed that there was a direct relationship between the amount of pesticides used and productivity. Thus pesticides were used excessively. Insecticide resistance developed in a number of species and beneficial insects were destroyed. Pesticides were applied more frequently, but with increasing resistance, pest populations climbed to disastrous levels. In addition, a number of previously harmless insects became serious pests. All this led to a 1955-56 season which was an economic disaster with yields dropping to 296 pounds per acre. The farmers

asked experiment station entomologists for help and a biologically sound program of pest control was introduced. This program led to an impressive reduction in pest problems and in a few years yields were the highest that they had ever been, ranging from 644 to over 900 pounds per acre.

Unlike the Canete Valley there are many places where appropriate, ecologically sound pest control programs have not been developed or implemented. In addition to such factors as increased rates of fertilization and irrigation and a greater number of plants per acre, resistance and the destruction of natural enemies have been important contributing factors to an increase in crop losses in the last 30 years. Over this time period the use of insecticides for insect control has increased about 10 fold.⁴⁸ During this same period overall losses of preharvest crops to pests have risen from 7 to 13 percent.⁴⁹

One of the most important uses of pesticides is to control those insects which are threats to the public's health, but the overuse of these chemicals can lead to

the increase of disease. The case of malaria, a disease transmitted by anopheline mosquitoes, provides an example. In several parts of the world these mosquitoes have tended to become resistant after repeated exposures to chemicals applied to protect crops. In Central America insecticides have been heavily used in the coastal plain areas to protect cotton. The chemicals have contaminated most of the coastal plain and the mosquito population has become increasingly resistant to a wide variety of them. Entomologist David Pimentel points out that, "Currently, all insecticides, with the possible exception of landrin, are relatively ineffective against this mosquito."⁵⁰

This phenomenon is not confined to Central America. An increased level of pesticide resistance in mosquitoes has contributed to an increase in malaria throughout the world.⁵¹ In the last five years the number of malaria cases reported to the World Health Organization has doubled and many cases are not reported.⁵² In the period from 1961 to 1963 malaria occurred at its lowest incidence in many parts of the world. During that time,

in India there were about 100,000 cases, but over the years pesticide use in agriculture increased and mosquito resistance increased with it.⁵³ By 1978 there were 50 million cases of malaria in India.⁵⁴

Criteria For Pesticide Regulation

The following chapters will look at various aspects of the regulation of pesticides. Clearly we will need some standards with which to judge this regulation, some criteria against which we can evaluate the law and the enforcement of the law which will be described. I shall offer several criteria for these purposes. Providing such criteria unavoidably involves the values of the author. The explanations offered in Chapter I of the values which I hold and of my perception of the role of values in policy analysis should make clear the philosophical basis on which these criteria have been framed. They are based on an assessment of what appears to be the basic consensus of most members of society that protection of the environment should be a primary goal. (This assessment is based on several public opinion

polls discussed in Chapter IV).

The criteria for pesticide regulation are as follows:

- 1) A strong basic law regulating pesticides.
- 2) The implementation of legal requirements which would facilitate the increased use of Integrated Pest Management techniques.
- 3) Effective enforcement of pesticide regulatory legislation free from arbitrary interference by Congress.
- 4) The production of accurate, objective, scientific data concerning the effects of pesticides on human health, wildlife, and the total environment.

The following chapters will illustrate how, on the whole, these goals have not even been approximated. But first they should be described in more detail.

A strong law. The first criterion is that there should be a strong law on which the regulation of pesticides is based. This law should prevent damage to human health or the environment from these chemicals. At the same

time it should take into account the farmer's need to avoid large crop losses to pests which would deny him a reasonable level of profit. Furthermore the law should consider the importance of pest control to public health. Thus it should allow for the use of pesticides when necessary, but it should promote the use of more environmentally sound means of pest control whenever possible. The law should not be a merely symbolic document. It should not be a piece of legislation which, on first reading, appears to provide adequate environmental protection, but which is so full of loopholes and exceptions or which is so poorly enforced that environmental protection can not be assured.

The use of pesticides is a fairly sophisticated technology with potential adverse effects which are quite serious. A law regulating pesticides should provide for a strong program of education so that pesticide users are well aware of the potential adverse effects of these chemicals. Those desiring to control pests should understand the biologically sound pest control methods which are available as an alternative to pesticide use. These methods are often quite

sophisticated and require a knowledge of the basic ecological relationships of certain plant pests and their predators and parasites. Thus, an educational effort aimed in this direction ought to be fairly substantial.

As will be further explained in just a few pages, biologically sound pest control methods use less pesticides and thus leave less potentially harmful insecticide residues on plants. The use of less pesticides, however, means that much produce, while quite safe and nutritional, will contain higher levels of blemishes caused by insect attacks and higher residues of insect parts. The American consumer presently tends to expect produce which is cosmetically appealing and which contains as close to a zero level of insect parts as possible. Many experts argue that the public is much more likely to be harmed by higher levels of insecticide residues on food than by eating food with surface blemishes and higher levels of insect parts.⁵⁵ Thus there should be a strong provision aimed at educating the public about the potential harm caused by pesticide residues on food and the lack of need for extremely high cosmetic or insect residue standards for food.

Requiring I.P.M. This requirement might have been discussed under the heading of the previous criterion, but treating it separately may be a means of making it more clear. Under the first criterion it was said that the law should promote the use of more environmentally sound means of pest control wherever possible. Specifically this means the promotion of the Integrated Pest Management system of pest control.

Integrated Pest Management (IPM) is a holistic strategy for pest control which attempts to manage a pest population rather than eradicate it.⁵⁶ It is a technique which strives to minimize damage to the surrounding environment because it is based on a philosophy that looks at the pest control problem as one of applied ecology rather than one of pesticide chemistry or merchandising.

IPM uses a variety of mutually augmentative techniques to control pests. These include: the use of natural enemies; certain cultural practices; the use of resistant crop and livestock varieties; microbial agents; genetic manipulation; chemicals which affect insect reproduction or development; and, when necessary, the use

of pesticides. An example of an IPM method is the use of natural enemies of pests. A natural enemy of the aphid is the ladybird beetle. The larva of a ladybird beetle may consume as many as 474 aphids in one day. Any one or combination of the above tactics are used according to the type of pest control problem encountered. All tactics used are integrated into a system to optimize the results of their combined use.

IPM is a constantly developing technique. It integrates the results of research to build models of crop production and pest management systems. These models are then used in advising farmers. Systems analysis is heavily relied on as a central unifying and research-guiding tool. Research requirements include a variety of disciplines and topics. Among these are the population dynamics of pests and their natural enemies, and the biological, ecological and economic processes in crop culture and growth.

The need for pesticides is not eliminated by IPM, but IPM uses pesticides more judiciously and to serve special purposes rather than for broad-spectrum efforts sought by regularized applications. For example Carl

Huffaker, an IPM expert, has estimated that the amount of insecticides and acaricides used in the United States on cotton, apples and citrus could be reduced by about half if IPM systems were put into practice.⁵⁷ A report published in 1979 by the Congressional Office of Technology Assessment estimates that IPM programs for major U.S. crops could reduce pesticide use by up to seventy-five percent, reduce pre-harvest losses to pests by fifty percent, and reduce the total costs of controlling pests by a significant amount.⁵⁸

Although pesticides are used when needed, most advocates of IPM stress the use of non-chemical methods to control pests wherever possible. Among the most often used non-chemical methods are the use of natural predators and parasites of pests. As in the previous example of the ladybird beetle, an attempt is made to manage fundamental biological variables so that predators and parasites (which are harmless to crops) of pests are kept at levels high enough to control them.

The public demands crops which are almost unblemished and which contain a very low level of insect parts, but, as explained earlier, the decreased use of pesti-

cides called for in IPM systems is likely to lead to crops which have higher levels of minor surface blemishes as a result of insect attack and to higher levels of insect parts remaining in picked crops. These crops would, however, be at least as safe and nutritional. Blemishes are harmless. They have no effect on nutritional content, storage, life, or flavor.⁵⁹ As for insect parts, all produce already contains at least some and all herbivorous insects found in or on fruit or vegetables are nonpathogenic to man.⁶⁰ Not only are they harmless, but they may even contribute to the nutritional value of food. Insects are eaten as a food by many people in other countries.⁶¹ Much pesticide is used unnecessarily merely to control blemishes and insect parts. About two-thirds of the insecticide used on tomatoes grown for processing is to control the tomato fruitworm, a pest which does damage which is essentially cosmetic in nature.⁶²

In addition to the amount of pesticide used, an important quantitative concept related to IPM is profit. It is not possible to say exactly how the widespread use of IPM would affect profits. Generally, the advocates

of IPM are concerned with ensuring a reasonable profit for the farmer. Many IPM studies indicate that for a particular crop in a particular area, these techniques can yield an equal or greater profit than conventional pest control methods. If IPM were the primary means of pest control in the United States, many farmers would earn profits equal to or greater than those they now earn without producing the adverse effects of pesticides. Nevertheless this is not the case for every crop or ecological system. There are situations in which IPM methods will not produce as much profit as conventional pesticides and IPM research is attempting to focus on this problem. However short term profit is not the only concern of this environmentally conscious technology. IPM is concerned with the long term optimization of the costs and benefits of crop protection. Some of these costs and benefits are as yet not completely quantifiable because they are not completely understood. For example the effects of pesticides on wildlife are often difficult to identify and thus to quantify.

Federal Pesticide Regulatory policy which was conducted in the public interest would include legislation, rules and strict enforcement which strongly encouraged

IPM. This method should be encouraged even in those cases in which profit would be somewhat reduced. How much profits should be affected by regulatory policy is impossible to specify exactly, but a regulatory scheme in which IPM is strongly encouraged and large losses in profit are avoided is possible. A reasonable reduction in profit would allow a closer approximation to a balance between the need for farmer's profits and the public interest just as, for example, steel industry profits are balanced against the public's need for clean air.

How should federal policy encourage the use of IPM? First, there must be strong funding for research. There is much which is not known about the many variables involved in IPM systems. A considerable amount of research has been accomplished, but much remains to be done.

Second, as has been mentioned, there should be a strong educational program to introduce farms to IPM methods, and to train IPM experts.⁶³ There should also be an educational effort aimed at demonstrating to the public the need for less stringent standards regarding insect parts in food or the cosmetic appearance of produce.

Third, the law should require that environmentally sound IPM methods be used instead of pesticides to control pests whenever possible.

If IPM is concerned with the need for profit, why coerce pesticide users into using it? Will not farmers tend to use IPM methods as they are developed by researchers? The problem here is one of implementing new technology and amount of profit. Although IPM methods sometimes provide as much or more profit than conventional means of pest control, many farmers are hesitant to try new technologies. Furthermore there is a considerable amount of knowledge which must be understood in order to use many IPM methods correctly. Learning and implementing this new technology is sometimes not as easy as merely applying a conventional pesticide.

At other times, IPM methods are available which produce a level of profit which is reasonable, but which is not as high as would be obtained by the use of conventional pesticides. However the criterion being proposed here suggests that the farmer's right to a profit is not absolute and that this right must be balanced against the public's right to protection from the adverse

effects of pesticides. Thus it is not, of course, being suggested that profits are unimportant, however this criterion would require that IPM methods be used wherever possible even if profits were somewhat reduced.

Another reason why IPM should be implemented by requiring that it be used is that often these methods do not work unless they are applied over a very large area. For example if many farmers plant the same crop year after year, they may provide an environment for pest populations which overwhelm the crops of neighboring farmers using IPM methods.

Also important is the concept of "learning by doing" as described by Michael Perelman in his article "Social Valuation of Pest Management Strategies."⁶⁴ According to Perelman "learning by doing" is an important concept to consider in the choice of pest management strategies. The experience acquired in the use and manufacture of chemical pesticides makes their use relatively more economic. By expending a great deal of effort in chemical pesticides, society forgoes the development of a comparable experience in biological control.⁶⁵

How could the use of IPM methods be required by the law? There are several ways in which legislation could bring about the widespread practice of IPM. For example in agriculture the law could allow for the establishment of pest control districts.⁶⁶ Each district would be a geographic area, perhaps a county, under the supervision of a federal pest control expert. Farmers would be permitted to use conventional pesticides only after the issuing of a permit for each application. Permits would be issued by the pest expert, or by licensed federal pest control experts under his supervision, only after alternative means of control had been considered and found wanting. If an alternative, effective, IPM method was available, a permit for the use of chemicals would not be issued. Chemicals which were dangerous, or which incomplete evidence suggested were dangerous, would not be approved for use unless the need for them was most serious and unless no effective, safer chemical was available. In this manner dangerous pesticides would be regulated in a way analogous to dangerous drugs.

A number of detailed proposals which would facilitate the increased usage of IPM methods have been

suggested, but the three fundamental needs discussed above (research, education, and legal requirements to consider IPM methods in the making of pest control decisions) are the essential foundations needed for the development of the potential inherent in this technology.⁶⁷

Effective enforcement. The law is a useful means of protecting man and the environment only if it is enforced. In order to enforce it the EPA must have adequate resources of personnel and money. If enforcement is to be vigorous, effective, and equitable, administrators must be allowed to regulate without fear of arbitrary or uneven interference by Congress. Arbitrary interference discourages an agency from taking aggressive action and tends to weaken the morale of agency personnel. It also violates the principle of "equal justice under the law" as less powerful actors will not be able to muster the political influence with Congress that more powerful ones can.

Accurate data. Accurate scientific data is needed by the Congress in its revision of the pesticide law, by the EPA in its administration of the law, and by the public. Congress has fairly often revised the basic law regulating pesticides. In making its changes, Congress needs to have the most accurate information available concerning the effects of the chemicals, in particular the effects on humans, wildlife, and the environment.

In a similar manner, the EPA is in need of a great deal of accurate information about the effects of pesticides. As will be explained in the following chapter, this agency decides whether or not to allow the registration of pesticides. (In order to be sold, all pesticides must be registered.) Registration decisions are based, in part, on the consideration of a great deal of scientific data concerning pesticide effects. A pesticide which the available scientific evidence demonstrates to be significantly harmful to human health, while not being economically essential, will not be registered.

Finally, the public is in need of accurate information concerning the effects of pesticides. If high quality scientific information is accurately reported

in the press, the public will be aware if the law regulating pesticides does not provide the degree of protection for human health which the public desires.

If a problem exists concerning the protection of human health, the public can generate pressure for legislative action to correct the problem. On the other hand, if the scientific information reported by the press is not always accurate or if reporters tend to publicize only one side of scientific controversies, such as whether or not certain tests comprise acceptable proof that a pesticide causes cancer, then the public may be much more inclined to accept pesticide regulatory policy in its present form.

A particular segment of the public which is especially in need of good data is those engaged in agricultural production. A farmer who is well aware of the potential adverse effects of a pesticide on his health or on beneficial species of insects may choose not to use it if an alternative means of pest control is available. If the adverse effects of a pesticide are well understood, farm worker groups may negotiate with employers to reduce or eliminate its use.

NOTES TO CHAPTER II

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C H A P T E R I I I
PESTICIDE REGULATION: 1910 TO 1980

Introduction

This chapter will provide an overview of pesticide regulation from its beginning in 1910 to 1980. It will focus on the basic legislation authorizing regulation examining the structural evolution of this legislation and the politics of this process. Regulation from 1910 to 1980 can be looked on as divided into two periods. From 1910 to 1972 regulation was based on statutes aimed primarily at protecting farmers. From 1972 to 1980 the law has included an emphasis on environmental protection. As has been noted, this dissertation will focus on the latter period but some knowledge of the former time is essential.

The early use of pesticides will be described along with the gradual accumulation of knowledge concerning their adverse effects and consequent demands for statutory changes to provide more stringent regulation. A fairly extensive description of the law regulating

pesticides is provided. This description is necessary in order that the reader understand some of the arguments made in later chapters.

Pesticide Regulation 1910 - 1970

1910-1947. In the middle of the 19th century, the trend in farming began to move toward the intensive cultivation of specialized crops. This created imbalances in nature which were ideal for the development of pest species. For example in 1850 the Colorado potato beetle lived on local plants in its natural environment and maintained a balanced population. When potatoes were planted by early settlers the beetles were provided with a vast new source of food and consequently their numbers greatly increased. To correct the effects of the imbalances of intensive farming, chemicals began to be used. In the case of the potato beetle, Paris Green, an arsenic compound provided control.¹

Federal regulation of pesticides began with the passage of the Federal Insecticide Act of 1910. (State regulation was begun in some states at an even earlier date). The act prevented the manufacture, sale or transportation of adulterated or misbranded insecticides

and fungicides and authorized regulation of the sale of insecticides and fungicides.² Its purpose was to protect farmers from fraudulent, ineffectual and misbranded pesticides. The basis of the law was post-market control. If fraud was discovered, the product could be taken off the market. The 1910 act was one of the last of a sequence of consumer protection laws begun around 1900 with the purpose of protecting the public from medical quackery and gross abuses in food processing.³

The act was administered by the Department of Agriculture which also conducted research on pesticides and pest control. Legislative jurisdiction was vested in the House and Senate Agriculture Committees. Thus at the very beginning the control of pesticides was institutionalized in the Department of Agriculture and in the House and Senate Committees on Agriculture. These committees have, up to the present, held primary jurisdiction over basic federal legislation concerning pesticides.⁴

In the early 1930's several books described the dangers to the public from unhealthy food and drugs. Then, after some public health scandals, the Food, Drug and Cosmetic Act (FDCA) was passed in 1938.⁵ This act was enforced by the FDA which, until 1940, was located in the Department of Agriculture. It permitted the

Secretary of Agriculture to allow the addition of a poisonous or deleterious substance to food if it was required in production or could not be avoided. The Secretary was required to promulgate regulations limiting the quantity of such substances in food. This was the beginning of a tolerance setting system which, in modified form, is still in use today. The process of setting these "tolerances" for pesticide residues in food was quite complicated and regulatory enforcement could be undertaken only after the product was marketed. If the Government believed that a particular food contained residues of a pesticide which were excessive, it had to wait until the product was marketed and then go to court to prove this assumption, with the burden of proof resting on the Government. An essential weakness of this system was that damage to the public could occur before the Government could prove its case.⁶

World War II significantly increased the demand for pesticides. Malaria was the most important single factor reducing the effectiveness of troops in the South Pacific. In that theater, it caused five times as many casualties as enemy action.⁷ This led to a great deal of research. The usefulness of DDT was dramatically demonstrated and just after the war, the first synthetic organic herbi-

cide, 2,4-D, appeared. The war brought about significant changes in the pesticide industry and in the role of the Federal Government.

After the war, a scientific agricultural revolution which had been delayed by the war and by the depression developed. Chemical manufacturers, who were geared for wartime production, found a large domestic market available for their new pesticides which became an essential part of the scientific agricultural revolution. The manufacturers expanded their research on chemical pesticides and took the lead in this endeavor away from government and university scientists. As interest in chemical pesticides grew, research in other pest control measures, especially biological controls, declined. As author John E. Blodgett puts it, "The era of synthetic organic pesticides was at hand."⁸

As the quantity and variety of manufactured pesticides increased, individual states increased the scope of their regulation. The Council of State Governments developed a uniform insecticide, fungicide and rodenticide act in 1946 for the consideration of, and adoption by the individual states. The act was subsequently adopted by many states. During this year, Congress began holding hearings on proposed pesticide legislation.⁹

Post World War II to Rachel Carson. In 1947 Congress repealed the 1910 Federal Insecticide Act and passed the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). The new law, which was designed to function in harmony with the uniform state insecticide, fungicide and rodenticide act, was passed in response to the appearance of a large number of new chemicals, many of which had been developed during the war. These new products were being vigorously marketed in unprecedented quantities and users were unable to assess their safety and efficacy.¹⁰

The administration of the new law remained with the Department of Agriculture. Its purpose was to protect the farmer from dangerous or ineffective pesticides. The act required that the product be safe when used in accordance with the label. Additionally it required:

1. The registration of pesticides prior to their sale or movement in interstate or foreign commerce
2. Prominent display of poison warnings on the labels of highly toxic pesticides
3. The coloring or discoloring of dangerous white powdered insecticides to prevent their being mistaken for foodstuffs
4. The inclusion of warning statements on the label in order to prevent damage to people, animals and plants

5. The inclusion of instructions for use to provide adequate protection for the public
6. That information be furnished to the administrator of the act with respect to the delivery, movement or holding of pesticides.¹¹

The USDA could deny a request for registration if the pesticide was found to be mislabeled, if it lacked adequate warnings and directions for use, or if it was injurious to beneficial organisms. The burden of proving safety and efficacy lay on the manufacturer; however if the USDA denied a request for registration, the manufacturer could still market his product under "protest registration" without any indication on the label that the product was not registered. This was because the law prohibited the label from indicating that the product had been registered. In order to remove an unregistered pesticide from the market, the Department had to prove in court that it was unsafe or mislabeled.¹² Thus the 1947 FIFRA was basically a labelling act. It set forth no sanctions against the misuse of a pesticide and no authority for immediate stop - sale orders against dangerous pesticides.¹³

After World War II some concern developed over the effects of pesticides on human health. In 1950 the House Select Committee to Investigate the Use of Chemicals In

Food was formed. Under the leadership of Representative James J. Delaney (D.-NY.), the select committee held a number of hearings and produced four reports, one of which recommended that chemicals used in or on foods be tested to establish their safety prior to their use.¹⁴

In 1954 the Pesticide Chemical Amendments (the Miller Act) to the Federal Food, Drug and Cosmetic Act were passed.¹⁵ This legislation required that if a pesticide would leave a residue on a raw agricultural product, the manufacturer had to obtain a "tolerance" for his product from the FDA before registering it with the Department of Agriculture, under the standards set up by FIFRA.¹⁶ The "tolerance" was an FDA specification of how much pesticide residue on or in a raw agricultural product was safe. The burden of proving that residue levels were safe was made the responsibility of the manufacturer. If the FDA, on the basis of the scientific evidence presented, decided that any amount of residue would be dangerous, they could refuse to establish a tolerance level. Without a tolerance, the manufacturer could not register the product with the Department of Agriculture. Any raw agricultural product which had a residue exceeding that set by the FDA could be seized and condemned.¹⁷ The Miller Act did not affect pesticides

which were not used on food such as household insecticides, mothproofing chemicals, and non-food crops.¹⁸

With several minor revisions this Act is still the basic legislation affecting pesticide residues.¹⁹ The EPA took over the setting of tolerances in 1970, but the FDA still handles enforcement.

In 1957 suspicions developed that large scale pest control programs of the Agriculture Department, particularly the fire ant control program, were having adverse effects on wildlife. Evidence to support these suspicions was sparse, so in 1958 Congress passed the Pesticide Research Act. The Fish and Wildlife Service in the Department of Interior had been doing research on the environmental effects of pesticides, but its staff and funds had been far from adequate. The new Act provided \$280,000 for research in 1958. The next year the authorization was amended to provide \$2,565,000 annually and research was considerably expanded. The studies resulting from this Act provided scientific evidence on the overall hazards of pesticides. The Act did not grant to the Interior Department any regulatory power.²⁰

From 1959 onward, a series of events tended to focus public attention on the hazards of toxic substances in the environment in general and pesticides in

particular. In 1959 an allegedly carcinogenic herbicide, aminotriazole, was found to have contaminated the autumn crop of cranberries. The Government condemned 55 million pounds of cranberries. Furthermore the public fear of contaminated cranberries so affected the market that Congress authorized \$10,000,000 to indemnify those growers who had not misused aminotriazole.²¹ A month later attention was focused on DES, a synthetic hormone used in poultry fattening. The use of the chemical had been legal, but testing techniques revealed residues which had hitherto been undetected. A statement by the Secretary of Health, Education and Welfare, claimed that there was no danger.²²

Also in 1959 there developed the first concerted opposition to the USDA's pesticide programs. All the major conservation organizations cooperated in opposing the fire ant eradication program which was being conducted in the southeastern United States.²³

In 1959 the 1947 FIFRA was amended to cover several new types of agricultural chemicals which had come into widespread use after 1947. The Act now included within its coverage nematocides, defoliants, desiccants, and plant regulators.²⁴

Pesticide politics in the sixties. Late in 1962 Rachel Carson's Silent Spring was published.²⁵ Carson's book claimed that pesticides were being used excessively and without proper consideration of their possible effects on wildlife or humans. She described, in language that the nonscientist could understand, many of the technical aspects of pesticide pollution, such as the tendency of some stable chemicals to concentrate in food chains. Carson did not call for a ban on pesticides. What she criticized was their use without adequate advance investigation of their effects on soil, water, wildlife and man.²⁶

The response to Silent Spring was extensive and emotional. Opinions were sharply polarized and the book was widely read and discussed. It was argued that it was unscientific and biased, and that it represented an anti-progress, defeatist philosophy. This point of view was put forth most vociferously by those associated with agricultural and agrichemical interests and by their academic consultants. On the other hand, many independent scientists and persons associated with conservationist and environmental groups praised the author for her timely warning.²⁷

Silent Spring educated the public concerning the

dangers of pesticides. Its educational influence was tremendous, but its significance was not solely related to the pesticide issue. The interest aroused by this book in environmental contamination by pesticides led to interests in other forms of pollution. When it had been demonstrated that one aspect of modern technology (pesticides) had been a source of environmental pollution, it soon occurred to many authors and scientists to examine the possibility that other aspects of modern technology were polluting the environment. While discussion of the causal significance of this book must be essentially speculative, at least one author has noted that, "The contemporary environmental movement as an active political force in some senses had its birth with the publication of Silent Spring" ²⁸

The success and influence of the book was undoubtedly due in great part to its quality, but also important was the context of issues and events which were felt to be important at the time it was published. Many new chemicals dangerous to man had appeared on the market since 1947. The concern over aminotriazole and DES, and opposition to the USDA's fire ant program have been mentioned. In 1962 the tragic effects of thalidomide on the babies of mothers who had taken the drug

directed attention to the teratogenic effects of chemicals. There was also concern over the effects of continued development on wilderness areas and the question of radioactive fallout was an active issue. Finally, there were several well publicized events such as a fish kill on the Mississippi River.²⁹ Within the context of these events and issues, Silent Spring acted as a catalyst to focus attention on the pesticide question and on environmental issues in general.

Ms. Carson's book led President Kennedy to ask the President's Science Advisory Committee (PSAC) to prepare a report on the use of pesticides.³⁰ The report was published in 1963. Among its most significant recommendations were the following:

1. The FDA should proceed as rapidly as possible with its current review of tolerances for pesticide residues on food and the experimental studies on which they are based.
2. More research on the effects of pesticides on wildlife should be conducted.
3. The toxicity studies upon which registration and tolerances are based should be more complete and of higher quality.
4. There should be an orderly reduction in the use

of persistent pesticides with a goal of eliminating their use.

5. The "protest registrations" allowed by the 1947 FIFRA should be eliminated.³¹

President Kennedy directed the responsible agencies to implement the recommendations in the report including the preparation of legislative proposals to be submitted to Congress.³²

In response to the PSAC report in 1964, an existing committee was reconstituted as the Federal Committee on Pest Control (FCPC) in order to coordinate pest control research and programs. The committee was the result of a formal agreement between the Department of Agriculture, Interior, and Health, Education and Welfare. It was to pay special attention to pesticide registration and the setting of tolerances. If scientists from the respective Departments could not reach agreement on a matter, it would be referred to the Department Secretaries for final action.³³

During the 1960's there were several attempts to enact legislation which would provide more stringent regulation of pesticides. Most of these attempts failed. In 1965 Senator Ribicoff introduced an unsuccessful bill which would have tightened regulatory controls over the

manufacturers of pesticides. Other unsuccessful bills called for closer control over the use of pesticides in programs funded by the Federal government and for the banning of long-lived insecticides.³⁴ For example in 1969, Senator Gaylord Nelson introduced a package of eight bills to prohibit the interstate sale and shipment of eight pesticides in the chlorinated hydrocarbon family: aldrin, chlordane, DDT, dieldrin, endrin, heptachlor, lindane, and toxaphene.³⁵

A series of attempt was made to give the Department of Interior a statutory voice in the registration of pesticides. During each Congress of the 1960's legislation was introduced which would have given the Department authority to provide information to be included on labels. In 1964 a bill passed the House which would have:

1. Increased USDI research
2. Ordered the Secretary of Interior to transmit information to the Secretary of Agriculture who would include the information on pesticide labels
3. Authorized the USDI to distribute to interested persons information about the effects of pesticides.³⁶

The strength of the agricultural interests in Congress can be seen in the fact that the Senate deleted all but part one of the above provisions before passing its version and in the fact that a final bill never got through conference. The USDA's dominant role in the regulation of pesticides was not to be successfully challenged.

Some legislative change was, however, inevitable given the attention focused on pesticides by Rachel Carson's book and the President's Science Advisory Commission report. In 1964 amendments to the 1947 FIFRA were adopted which strengthened the statutory basis for controlling pesticides.³⁷ Protest registration was eliminated. Manufacturers would no longer be allowed to sell pesticides which were not registered in interstate commerce. The new bill provided manufacturers who disagreed with the pesticide registration decisions of the Agriculture Department's Pesticides Registration Division, the right to request a hearing or the creation of a science advisory committee to decide on the registration, or both a hearing and a committee. Any person "adversely affected" could challenge in court the decisions made under the Act. Furthermore, procedures for expediting the suspension

of marketing of previously registered pesticides which were found to be unsafe were authorized.³⁸

The legislation was not adequate to provide stringent control of pesticides. For example intrastate commerce was not regulated. Nevertheless it did provide the basis for at least a significant degree of regulation by the USDA. However, although the statutory basis for providing at least some protection for the environment now existed, the law was enforced with little enthusiasm or vigor by the USDA.

During the 1960's research on pesticides increased greatly. The increase in research was accompanied by the establishment of journals for the dissemination of research results.³⁹

During the second half of the 1960's there were several congressional hearings, congressional committee reports and reports by scientific panels. In 1965, another report was put out by the President's Science Advisory Committee. The report, Restoring the Quality of Our Environment considered pesticides along with other aspects of pollution. Several recommendations were made, the most important being that increased attention be given to "persistent" pesticides and that the Department of Agriculture take steps to encourage a reduction in insecticide use.⁴⁰

In 1966, a report by the Senate Committee on Government Operations stressed the point that pesticide risks should be weighed against benefits. The report made a number of recommendations aimed at strengthening the pesticide regulatory system, improving coordination of Federal programs affecting the environment, protecting human health, and providing a more adequate basis for future national policy in environmental management.⁴¹

Also in 1966 a report by the staff of the House Appropriations Committee suggested that Ms. Carson's book had been one sided and had unnecessarily caused public concern over the effects of pesticides on health.⁴² Among the things the staff had been instructed to examine was whether or not regulations were needed to control irresponsible actions, state-⁴³ments and criticisms of agricultural pesticides.

In 1964 the Department of Health, Education and Welfare contracted with the Bionetics Laboratory for a long range study of the chronic effects of a large number of pesticides. The results of this study began to become available in 1966 and the last studies were completed around 1970. These studies had a significant effect on later policy. The acute effects of pesticides had been well known and were usually obvious to someone witnessing

a case of pesticide poisoning. The chronic effects were much less studied and understood. The most serious and important long term effect was the tendency of some pesticides to cause cancer. The results of the Bionetics study were often not conclusive due to disagreement on testing methodologies and the interpretation of results. However they did focus attention on the problem of the chronic effects of agricultural chemicals.⁴⁴

In April 1969, a Commission (the Mrak Commission) was appointed by the Secretary of Health, Education and Welfare and charged with the responsibility of gathering all available evidence on the benefits and risks of using pesticides, evaluating this evidence thoroughly and reporting its findings and recommendations. The report produced in December 1969 by this prestigious commission was the most comprehensive one produced on the subject up to that time. It organized and evaluated the available information about pesticides including data on carcinogenicity, mutagenicity, teratogenicity and the effects of pesticides on nontarget organisms other than man.⁴⁵

The Commission concluded that there was adequate evidence concerning potential hazards to the environment and human health to require corrective action. It suggested that such action be taken immediately to prevent

further environmental contamination from pesticides and to protect human health. It recommended that human exposure to potentially hazardous pesticides be minimized and it set forth a number of specific suggested policy changes designed to provide more effective and stringent regulation of pesticides and more consideration of their effects on human health. Among the several specific recommendations were:

1. Eliminating within two years all uses of DDT except those essential to human health and welfare
2. Improving research on all methods of pest control and on the adverse effects of pesticides
3. Providing incentives to industry to encourage the development of better pesticides.⁴⁶

During this period there was considerable criticism of the USDA for not providing more effective pesticide regulation. Two GAO reports provided strong evidence that the Department's regulatory efforts were extremely weak. One report in 1968 found that there had been no actions by the Department to report violators of FIFRA for prosecution in 13 years even though, in some instances, prosecution appeared warranted.⁴⁷ This was true even in instances where repeated major violations

of the law were cited by the Department and when shippers did not take satisfactory action to correct violations or ignored Department notifications that prosecution was being contemplated. The GAO found that Agriculture's operating guidelines did not even include procedures for determining when shippers which had apparently broken the law would be reported to the Justice Department for prosecution.⁴⁸

A second GAO report in 1969 noted that the Department registered lindane pellets (an insecticide) for use in continuously vaporizing devices in restaurants and other food handling businesses even though the Public Health Service, the Food and Drug Administration and other Federal, State and private organizations had long opposed this use.⁴⁹ These agencies had questioned the adequacy of data used to prove that this use of lindane was safe. The report criticized the Department for not either resolving the question of safety or restricting this use of lindane and it urged action to resolve the question of safety.

The GAO reports were followed by oversight hearings by a subcommittee of the House Government Operations Committee (the Fountain hearings).⁵⁰ The hearings showed that the USDA's regulation of pesticides gave little

emphasis to environmental safety. In accordance with a prior agreement, the Department had submitted pesticide registration applications to the Interior and Health, Education and Welfare Departments for comment. However it had ignored every objection put forth by these Departments and it had never withheld a pesticide to which they had objected.⁵¹ The report which followed these hearings was very critical of the USDA.⁵²

In 1969 environmentalists, frustrated in their attempts to protect the environment from pesticides through legislative change, turned to the courts. The Environmental Defense Fund (EDF) sued the USDA and DHEW to force them to end the registration of DDT. The basis of the suit was that DDT was an environmental hazard and, as such, mislabeled according to the standards of FIFRA. The USDA challenged the standing of the EDF to sue, but the court decision accorded standing to private interest groups to seek judicial review.⁵³ The possibility of court action was a new pressure on pesticide decision makers to carefully consider the environmental consequences of their actions. If they did not, the courts would perform this task for them.⁵⁴

1970-1972 A New Agency to Regulate and
A New Law to Administer

Pesticide regulation goes to the EPA. The events of the 1960's had indicated that the Department of Agriculture was not likely to provide enthusiastic protection of public health or the environment through the enforcement of FIFRA. In particular, the GAO reports of 1968 and 1969 and the 1969 report of the House Committee on Government Operations had provided strong evidence that stringent regulation of pesticides by the Department was unlikely.

Although they have adverse effects, pesticides are often an effective way to increase profits by reducing losses from insects, weeds and other pests. A study completed in 1975 indicates that farmers do tend to have positive attitudes toward their use.⁵⁵ In all of the hearings held on pesticide legislation from 1971 to 1980, farm groups almost always tended to oppose measures which would provide more stringent regulation and to support proposals which would lead to more lenient regulation. We can describe farmers as a constituency which is generally opposed to stringent regulation of pesticides.

The primary constituency of the USDA is the farmers. In its regulation of pesticides, the Department tended

strongly to represent only farmers. The interests of food consumers were represented by the Department of Health, Education and Welfare through its Food and Drug Administration. The interests of those supporting the preservation of wildlife were represented by the Department of the Interior, but because the USDA retained primary control over pesticide regulation, the interests of agriculture were not balanced against those of public health and the environment. Administrative changes had attempted to give DHEW and Interior more influence over pesticide regulatory decisions, but their recommendations were often ignored and USDA retained most of its influence over regulation. The 1964 Amendments had sought to provide more protection from the effects of pesticides, but it now became apparent to many that, due to its philosophical orientation and political constituency, the USDA would never provide vigorous enforcement of any law regulating pesticides. By 1970, the logical choice for a different agency to fulfill this function was the Environmental Protection Agency which was established in that year.

The Environmental Protection Agency began to function on December 2, 1970. The new agency was formed as the result not of legislation, but of an executive

initiative. Among the EPA's responsibilities was the regulation of pesticides. The Pesticides Regulation Division of the USDA was transferred to the EPA as was the tolerance setting office of the FDA. Also transferred was Interior's authority to do research on the effects of pesticides on fish and wildlife. The EPA was now the major regulator of pesticides. Regulation was concentrated in one agency responsible to the general public for the protection of the environment, not to a particular segment of the public.⁵⁶ Many of the EPA personnel responsible for the regulation of pesticides had been transferred from the Department of Agriculture. These people brought with them attitudes which generally tended to support the almost unrestricted use of pesticides. They tended to be skeptical about claims concerning environmental damage or threats to public health. These attitudes eventually led to substantial internal conflict within the EPA especially between these people and the lawyers charged with enforcement responsibilities.⁵⁷

1972: A major revision of FIFRA. The new agency brought enthusiasm to its role of environmental protection but the law with which it had to work was in need of

revision. The 1947 FIFRA had been written at a time before Silent Spring and the ensuing wave of hearings, committee reports and scientific studies had brought the environmental effects of pesticides to the public's attention. It was a law designed primarily to protect the farmer from defective products by ensuring that the registered pesticide did what its label said it did. The primary concern was that the registered product meet the claims made in its label concerning the control of pests. The focus of regulation was on the label, not on the way in which the substance was used. In fact, the use of a pesticide not in accordance with the label was not illegal. Protection of the consumer was based on strict adherence to the label directions. If an economic poison was extremely dangerous when not used in accordance with label directions, but comparatively safe when used according to label directions, its sale could not be banned. The problem was that many users did not bother to read label instructions. Furthermore, the label instructions were sometimes so complicated that it was impossible for many poorly educated users to understand them.

In this regard several courts held that misuse of an otherwise properly labeled product could not be

prevented by cancelling or suspending its registration.⁵⁸
For example in Stearns Electric Paste Co. v. EPA, the EPA tried to cancel the registration of a phosphorous paste for use as a home roach and rat killer after nationwide reports that its misuse had caused the deaths of adults and children.⁵⁹ The EPA contended that regardless of the label contents, the product was too dangerous to be sold because, "the general public is incapable of handling these things and following directions." In ruling against the EPA, the court pointed out that the record showed a long history of safe use of this product when used in accordance with the label. It held that the manufacturer had made a prima facie showing that the pesticide satisfied the standard of the law for continued marketing. The court acknowledged that the use of a safety standard was appropriate to determine whether to allow the continued sale of a product such as DDT which had a known potential for harm even when used in compliance with the label, but it decided that a different situation is presented when the harm is entirely, or at least primarily, attributable to the misuse of the product.

A pesticide could be removed from commerce only if the Administrator of the Act found it to present an

"imminent hazard" to the public.⁶⁰ The term "imminent hazard" was not defined. Furthermore, there was no provision requiring the administrator to publish guidelines specifying what environmental or human health criteria would qualify a pesticide for registration. This lack of definition and legislative provision for rules led to several court cases. In the absence of congressionally required guidelines, the courts began to indicate that they would provide them in the course of responding to the increasing number of appeals to them. In comparison to Agency establishment of legislatively mandated rules this would have been an inefficient and often unpredictable process. One court's decision might not always have been consistent with that of preceding ones. Environmentalists and the pesticide industry felt that judicial implementation of FIFRA was a too unpredictable means of regulation.⁶¹

Thus it was felt by many that a totally new statutory basis for regulating pesticides was needed. In February 1971 the Administration proposed legislation which would completely revise the regulation of pesticides.⁶² The Council on Environmental Quality called revision of FIFRA one of the top five environmental priorities of the year.⁶³ After fifteen drafts, four congressional

hearings, and almost two years, the Federal Environmental Pesticide Control Act of 1972 (FEPCA) became law on October 21, 1972.⁶⁴

The 1972 FEPCA (also referred to as FIFRA) amended and completely revised the old 1947 statute. The 1972 law was slightly revised in 1975, more substantially revised in 1978, and again, slightly revised in 1980, but its basic structure has not been changed and it is still the fundamental framework for the regulation of pesticides. Thus in order to provide an understanding of the regulation of pesticides this law must be explained in considerable detail. The new law, for the first time, recognized the environment as a quality to be protected. It regulated not only the contents of the pesticide label, but also the use of the product. It was now illegal to use a pesticide in a manner inconsistent with the directions for its use on the label.⁶⁵

No pesticide could be sold either in interstate or intrastate commerce unless it was registered with the EPA. In order to be registered, the product had to meet the claims which the manufacturer made for it concerning its effectiveness in controlling pests. Furthermore the Administrator had to be assured that when the product was used in accordance with widespread and

commonly recognized practice it would not generally cause "unreasonable adverse effects on the environment." Thus a pesticide which caused unreasonable adverse effects on the environment if not used in strict accordance with label instructions would not qualify for registration if the instructions were not consistent with "widespread and commonly recognized practice."⁶⁶

The term "unreasonable adverse effects on the environment" was defined as "any unreasonable risk to man or the environment, taking into account the economic, social and environmental costs and benefits of the use of any pesticide."⁶⁷ This term has been the focus of much of the decisionmaking based on FIFRA, and it is based on cost - benefit analysis. The participants in the process of implementing FIFRA have tended to use the word "risk" more often than "cost" although the latter term is often used. Thus risk - benefit analysis is the basis of registration decisions made under FIFRA.

As part of its registration a pesticide was to be classified as "general use" or "restricted use." These classifications applied not only to the pesticide, but to its specific uses. Thus one pesticide might be classified for "general use" for all uses, another might be classified as "general use" for use on one crop and

"restricted use" on another crop. A "general use" pesticide could be used by anyone. "Restricted use" products were, as the name implies, those substances which required caution and knowledge concerning their use. If a product was classified as restricted because its use, without additional regulatory restriction, would cause unreasonable adverse effects on the environment, it was required:

1. That it be applied only by or under the direct supervision of a certified applicator or
2. That its use be subject to such other restrictions as the Administrator may provide by regulation.

If a pesticide was classified as restricted because its acute dermal or inhalation toxicity presented a hazard to the applicator or other persons, it could be applied only by or under the direct supervision of a certified applicator.⁶⁸

A certified applicator was one who was competent with respect to the use and handling of pesticides.⁶⁹ The law directed the Administrator to prescribe standards for the certification of pesticide applicators. In order for a state to certify, it had to submit a plan

for this purpose which had to meet certain requirements specified in the law and which had to be approved by the Administrator. After approving a state plan, if the Administrator determined that the state was not properly administering its plan, he could withdraw approval.⁷⁰

The original legislative proposal submitted by the Administration to Congress contained three classifications: "general use," "restricted use," and "use by permit only." The "use by permit only" classification would have included products which tended to have a long term adverse effect on the environment and were a potential threat to human health. Their use would have been restricted to situations of real need and would have depended on the approval in writing of a pest management consultant who possessed a state license indicating that he had met certain standards approved by the Administrator. Approval would be necessary for each application.⁷¹

This provision would have been analogous to the legal requirement that certain drugs with potentially harmful side effects can only be obtained by prescription from an expert (a physician) who is certified as qualified to determine that they are needed. It would have cut down on the unnecessary use of pesticides

and encouraged the consideration of biological means of control. If a satisfactory means of biological control were available, a pest management consultant would probably have refused a request for the use of a dangerous pesticide. By reducing the amount of dangerous pesticides released into the environment, this provision would have made FIFRA a much more effective means of protecting the environment; however Congress deleted the classification from the enacted legislation.

In order to prove that his pesticide product warranted the claims made for it and did not cause an unreasonable adverse effect on the environment, the manufacturer had to submit data to the Administrator of the EPA. The Administrator was required to publish guidelines specifying the kinds of data which would be required.⁷² These guidelines were subject to revision from time to time. They were quite extensive and the completion of the many tests required to register a product was very expensive. Testing was the responsibility of the manufacturer. He could perform the tests himself or pay a commercial laboratory to do the work. The EPA's role was merely to check the completeness and validity of the data.

A potential for conflict existed if a second manu-

facturer wished to obtain for himself a registration for a pesticide already registered by another manufacturer. Under the law the second manufacturer had to perform all of the tests which had already been performed by the first registrant unless he wished to pay the first registrant reasonable compensation for the use of his data. Although in possession of the first registrant's data, the Administrator could not use it to support a second registration unless the second applicant offered to pay a reasonable compensation for the use of the data, and unless the data was not classified as a "trade secret." If the parties could not agree on the amount and method of payment, the Administrator was authorized to determine a just figure. The Administrator's decision could be appealed by the owner of the test data in federal district court.⁷³

The Administrator was not to make public or use for registering a pesticide any information which in his judgment related to trade secrets. However, if it was necessary to carry out the provisions of the Act, he could reveal such information to any Federal agency consulted, or at a public hearing, or in findings of fact. If he wished to release any data for inspection which the owner considered to be a "trade secret," he

was required to notify the owner of the data in advance. The owner could institute action in an appropriate district court for a declaratory judgment as to whether his information was subject to protection.⁷⁴

The opportunity for litigation created by the provisions for judicial review of the Administrator's decisions on compensation for data and, in particular, on trade secrets, was tremendous. In fact the large number of cases brought under these provisions eventually became one of several factors leading to a complete halt in EPA pesticide registrations.

The registration of a pesticide had to be "cancelled" if the registrant did not renew his registration every five years. It was also required that registration be cancelled if it appeared to the Administrator that a pesticide or its labelling did not comply with the provisions of the Act, or, when used in accordance with widespread and commonly recognized practice, generally caused unreasonable adverse effects on the environment. Prior to cancellation a hearing was required if the registrant requested it, and a decision of the Administrator to cancel a registration following a hearing was judicially reviewable.⁷⁵

The cancellation process did not allow for the

immediate removal from commerce of a pesticide which was causing significant damage. The hearing allowed for by the provision for cancellation could take several months and some of the hearings lasted for several years. Therefore the law provided that if action was required to prevent an "imminent hazard" during the time required for cancellation, the Administrator could "suspend" the registration of a pesticide after an expedited hearing on whether or not an imminent hazard existed. If the Administrator determined that the danger posed by the chemical in use permitted no delay at all, he could suspend the registration of the chemical immediately and hold a hearing on the suspension after taking the action. Orders to suspend pesticides were judicially reviewable.⁷⁶

If the registration of a pesticide was first suspended and then cancelled, the law provided that the owner of any quantity of the product be compensated for his loss unless he had knowledge of facts which would have shown that the chemical did not meet the requirements of the Act for registration and continued thereafter to produce the substance. If the stocks of a cancelled pesticide were large, this provision might cost the government a great deal of money. Therefore the law

provided that in lieu of compensating owners for their losses, the Administrator could provide a reasonable time for the use of existing stocks until all stocks were depleted.⁷⁷ This money saving provision has proved to be controversial. Environmentalists have maintained that if a substance is dangerous enough to be suspended and then cancelled, it is too harmful for existing stocks to be sold.

The Act authorized the Administrator to make regulations in order to carry out its provisions. Before these regulations could be published, the views of the Secretary of Agriculture had to be solicited. All regulations were required to be in effect within four years of the passage of the Act, but those providing for registration and classification of pesticides were required to be promulgated within two years. After two years, but within four years of the enactment of the law, the Administrator was required to have completed the reregistration and reclassification of pesticides registered under the provisions of the pre-1972 law.⁷⁸

The new law provided numerous opportunities for hearings and for judicial review. In the case of actual controversy as to the validity of any order issued by the Administrator following a public hearing, any person

who "will be adversely affected" by such order and who had been a party to the proceedings could obtain judicial review by filing in the United States court of appeals.⁷⁹

The overall enforcement responsibility for the 1972 FIFRA rested with the Administrator of the EPA. His agency registered pesticides and pesticide producing establishments, oversaw the certification of applicators, and evaluated the toxicity and safety of pesticides. In order that EPA might enforce the Act, the law made a number of demands on manufacturers. They were required to keep records concerning their products and to submit information concerning the amounts and types of chemicals they produced.⁸⁰ Provisions were made for the inspection of manufacturing plants and new civil and criminal penalties for violations of the law were established.⁸¹ Any registrant who knowingly violated any provision of the Act could, on conviction, be fined not more than \$25,000 or imprisoned for not more than one year or both.⁸²

Considerable enforcement responsibility was provided by the Act for the states. States could train and certify applicators of restricted pesticides if the state plan for this purpose was approved by the Administrator of the EPA.⁸³ Most training of applicators is done

by the states. The states could regulate the sale and use of pesticides within their boundaries as long as the regulation did not permit a sale or use prohibited by the Federal Act. Also a state could register a pesticide formulated for distribution and use within the state to meet special local needs if certified to do so by the EPA Administrator and if registration for such use had not previously been denied by the Administrator. This registration could be disapproved by the Administrator within 90 days.⁸⁴

The Administrator of the EPA was authorized to enter into cooperative agreements with the states in order to delegate to any state the authority to cooperate in the enforcement of the Act.⁸⁵ In actual practice much enforcement authority has been delegated. The EPA has focused on control over registration, classification, labeling and evaluation of toxicity and safety. The states have emphasized control over local distribution, storage, use and disposal.⁸⁶ Municipal and local governments play a minor role.

The act provided that the Administrator undertake research as necessary to carry out the purposes of the law. Priority was to be given to research in biologically integrated alternatives for pest control. A specific

research requirement was for a national plan for monitoring residues of pesticides in the environment.⁸⁷

This required monitoring in air, water, soil, plants, man and animals.

During the two years in which the proposed bill was revised in hearings it was the focus of extensive discussion. Discussion focused on several important topics. Perhaps the most important was the scientific evidence concerning the effects of pesticides. The experience with DDT served as the primary basis for this discussion. Evidence was presented which indicated that DDT was harmful. Other evidence indicated that it was safe.

Other areas of discussion included the effects of pesticides on farmworkers, alternatives to chemical pesticides, the proposed "use by permit only" classification, the use of data, the payment of indemnities for unused stocks of cancelled pesticides, and "essentiality." This last term refers to the proposal by some environmentalists that if a request were made for the registration of a pesticide for a use for which there already existed an adequate registered pesticide, the request should be denied. This proposal, it was felt, would limit the number of different types of pesticides in the environment, and thus decrease the possibility of damage

resulting from the use of a new chemical whose effects were not as well understood as those of chemicals which had been in use for a long time. The proposal that the "essentiality" of a pesticide be considered as one of the requirements for its registration was defeated.

In the passage of the bill, a conflict developed between two Senate committees. A bill passed the House in November 1971. The Senate Agriculture and Forestry Committee's Subcommittee on Agricultural Research and General Legislation made a large number of amendments to this bill and then referred it to the Senate Commerce Committee's Subcommittee on the Environment. The Agriculture Committee is, and always has been, less than enthusiastic about tight control over the use of pesticides. On the other hand, the Subcommittee on the Environment had an interest in environmental protection. Thus the fact that the Commerce Subcommittee had a legislative input into the new legislation is important. This committee made many amendments to the proposed legislation. These amendments would have made the legislation a much more effective means of protecting the environment, but the greatest number of them were not included in the final bill. However, some of the amendments were included in the final legislation. Others were included but in a compromised form. For example one

amendment proposed to raise the maximum civil penalty from \$1,000 to \$10,000. The figure in the final bill was \$5,000.⁸⁸ The most important Commerce Subcommittee amendments related to criteria for registration. The Agriculture Subcommittee's bill had made the basic criterion for registration of a pesticide and for other actions under the Act, the requirement that the chemical have no "substantial adverse effects on the environment." The Commerce Subcommittee substituted the phrase "unreasonable adverse effects on the environment" and this phrase was included in the final bill.⁸⁹ The Committee's reasoning was that if a pesticide had a significant but not "substantial" adverse effect on the environment and if the substance was of low utility, the EPA would be powerless to stop its use. The new phrase allowed the EPA to weigh the risks against the benefits of a pesticide if any adverse effect was discovered. It was the Subcommittee's intention that ". . . any adverse effect ought not to be tolerated unless there are overriding benefits from the use of a pesticide."⁹⁰ The inclusion of the new phrase was of great importance. Because it is the basic criterion for registration, and classification, disputes over registration, cancellation, suspension and classification have centered over its

meaning. It has meant a balancing of risks against benefits, but how risks and benefits are defined and where the proper balance lies, has been the subject of lengthy debate.

After the Senate Commerce Subcommittee made its amendments, the Senate Agriculture and Forestry Committee prepared a supplementary report criticizing the Commerce Committee proposals and explaining its opposition.⁹¹ Eventually a compromise was worked out and the bill passed the Senate. A Conference committee settled House-Senate differences and the bill passed both Houses and was signed into law.

The final legislation was a collection of compromises. It did provide the framework for a significant degree of regulation of pesticides. The amount of protection to man and the environment which its enforcement would provide was insufficient to meet the goals of "adequate" regulation set forth by this dissertation and supported by many environmentalists. However the law has led to the banning of all or most uses of a considerable number of pesticides. While not adequate from the environmental perspective, the law is also far from useless. It has been the means of significant progress in removing dangerous pesticides from commerce.

The Administration of the Act by the EPA has often been criticized by industry officials who feel that the Agency is interpreting it too strictly and by environmentalists who see the EPA as being too weak in its enforcement. The law explicitly recognized the environment as an area in need of protection. It provided a criterion (unreasonable adverse effects) and a structure (guidelines for registration, hearings) for providing that protection by removing at least a significant number of chemicals from trade. A requirement was set forth for at least some education for applicators of the most dangerous poisons in the procedures for certifying applicators of restricted pesticides. In the area of enforcement, provisions such as the ones for inspecting establishments and establishing penalties for violations gave the EPA the means to enforce the law.

Probably the biggest weakness in the law was that it did not provide any means to encourage the use of ecologically sound Integrated Pest Management techniques. It did fund research on IPM, but there were no provisions to encourage its use. Retaining the "use by permit only" classification of pesticides which was in the original Administration bill and the establishment of pest control districts under the supervision of a pest management

consultant would have allowed for considerable implementation of IPM. The pest management consultant could have been directed to deny requests for use of pesticides when a satisfactory IPM method was available.

The use of IPM often requires special "third generation" pesticides such as viruses or bacteria. The law made no specific provision for the registration of these non-chemical pesticides.

Other weaknesses included the provisions for state enforcement, the complexity of the law with its many opportunities for rulemaking, hearings and judicial review, the lack of a specific provision authorizing citizens' suits, the lack of strict requirements for the training of applicators of restricted chemicals, and the provision for the payment of indemnity to owners of substances whose registration was suspended and then cancelled.

The amount of protection of human health and the environment which the law did provide was due in general to the political climate of the time and specifically to the input of the Senate Subcommittee on the Environment. As has been described, the subject of pesticides had been brought to public attention primarily by Rachel Carson's book in 1962. In subsequent years the focus

provided by other books and by congressional and Administration attention in hearings and reports had kept the issue alive. Furthermore, at the time of the law's passage public opinion tended to strongly support efforts to protect the environment.⁹² The contribution of the Senate Commerce Subcommittee was significant as it provided a criterion for registration which was more likely to lead to the banning of dangerous chemicals. Although many of its proposals were not included in the final legislation, the knowledge that this Subcommittee would eventually have an input into the legislation framing process probably did much to discourage the House and Senate Agriculture Committees from deleting more of the environmentally sound provisions from the original Administration bill.

Thus the law did provide some measure of protection for the environment. This protection was accompanied by industry irritation. By 1973 as the public began to realize that some environmental goals would necessitate economic burdens, the initial enthusiasm for protection of the environment diminished.⁹³ When FIFRA was revised in 1975, 1978 and 1980 the changes tended to weaken the legislation. Indeed the history of Congressional oversight and revision of this law since 1972 is character-

ized by legislative changes which have weakened its effectiveness in protecting health and the environment and by Congressional interference with responsible administration of the law by the EPA.

1973-1975: EPA Enforcement
and Congressional Reaction

1973-1975: Interest group reaction, congressional pressure, and GAO criticism. The passage of FIFRA in 1972 did not signal the end of controversy related to pesticides. On May 4, 1973 the House Committee on Agriculture held a short hearing to examine EPA implementation of FIFRA. The participants discussed such issues as the proper means of compensating a pesticide producer for the use of his health and safety test data by another company, and other issues related to FIFRA implementation. Much time was consumed, however, by congressmen's lectures to EPA officials concerning what the legislators felt to be the Agency's excessive zeal in such areas as establishment of standards for exposure of farmworkers and the control of DDT. The congressmen also maintained that there were problems concerning control of the gypsy moth, tussock moth and predators of livestock which were, it was claimed, caused by the EPA's

excessively stringent control of chemicals designed to
kill these pests.⁹⁴

A clear effort to undermine FIFRA was made in October 1973 when a House Agriculture subcommittee held hearings on a bill which would have directed the Administrator to approve the use of DDT to control the tussock moth, a forest pest.⁹⁵ Although DDT had already been banned for most purposes, the Department of Agriculture had requested an emergency exemption (which is permitted under FIFRA) to use DDT to control the moth. This request had been denied by the EPA, but after the House hearings and the threat of legislation the Agency gave in and approved a subsequent request.⁹⁶ This decision and its ecological consequences has been heavily criticized by environmentalists.⁹⁷

A counterbalance to the Agriculture Committee was the oversight hearings on the administration of FIFRA held in August 1974 by the more environmentally oriented Senate Subcommittee on Environment. Several environmentalists testified criticizing the EPA's implementation of FIFRA and the hearings were generally oriented toward the environmental point of view. In fact no industry or farm group representatives testified.⁹⁸

1975 Revision of FIFRA

By 1974 the EPA had either begun action against or cancelled the registration of aldrin-dieldrin, mirex, pesticides containing mercury, and DDT. In October 1974, most uses of aldrin-dieldrin were suspended. In November, it was announced that hearings would be held leading to the possible cancellation of heptachlor and chlordane. Environmentalists considered these five major enforcement actions in five years to be pitifully few and suggested ways to simplify the cancellation and suspension hearing processes; however, the EPA's actions did indicate that the Agency intended to take some regulatory action in regard to pesticides and the reaction of farmers and industry was strong.⁹⁹

Thus by 1975 it had become apparent that the direction of EPA's movement in regard to pesticides would be toward a degree of regulation which was more stringent than what was desired by many farmers, pesticide industry executives and congressmen. Within the Agency there were many people who did not favor the strict regulation of chemicals. This attitude was particularly prevalent among the transferees from the Department of Agriculture who had been moved into the

EPA in 1970 when the Agency took over the regulation of pesticides. On the other hand there were many new entrants in the Agency with a strong commitment to environmental protection. The result of the interaction of these groups, along with many organizational and managerial problems encountered in administering a very complex law, was a regulatory policy which fell considerably short of the expectations of environmentalists, but which was generally oriented toward environmental protection.

Farmers tended to see regulation of pesticides as an intrusion of naive and unfeeling bureaucrats and there were numerous complaints by farmers concerning many aspects of FIFRA and its enforcement. As one congressman put it, there are two aspects of government regulation that cause problems in his district - OSHA and FIFRA. Many of the alleged harmful effects of pesticides concerned their possible carcinogenic properties. Since the latent period for the development of cancer can be as long as twenty years, and because only a fraction of those exposed to a carcinogen will develop cancer, it was difficult for farmers who had used suspect chemicals for years to realize their potential harmful effects. Their attitude could be summarized in the often heard statement,

"If it's so harmful, why hasn't it hurt me, I've been using it for years." There was also considerable reaction among farmers against the training programs which were being established in each state for the applicators of pesticides classified as "restricted." Under the 1972 law these "certification" programs had been mandated for those who would apply these more dangerous chemicals, however many farmers saw the program as an unreasonable governmental requirement, and as inefficiently run by the EPA.¹⁰⁰ The pressure for less stringent certification requirements put on congressmen from agricultural districts was quite strong.

Furthermore, during the 1972-1975 period the EPA found itself in the middle of a number of pesticide-related disputes including: the use of 2,4,5T, the safest means of predator control, strobane residues in food, the use of vinyl chloride as an inert ingredient in pesticides, and the "Pesticide Hotline," a toll free number set up by the Agency in 1975 so that citizens could report incidents of pesticide misuse directly to the Agency.¹⁰¹

While farmers and the industry were unhappy with what they considered to be EPA's overenthusiastic attempt to protect the public, a series of reports by the General

Accounting Office (GAO) indicated that it was not doing enough.¹⁰² A report issued in April 1973, noted, among other criticisms, that while the Agency had cancelled or suspended the registration of certain pesticides containing 2,4,5T, mercury, and thallium sulphate, it had allowed other pesticides containing the same ingredients and registered for the same uses to stay on the market. The report recommended that the Agency suspend all pesticides containing these ingredients beyond established limits. It also criticized the Agency for a lack of promptness in starting cancellation and suspension hearings. Furthermore it suggested that it should make every effort to have all pesticides found to be imminently hazardous removed from the channels of trade.¹⁰³

A GAO report issued in May 1974, focused on the EPA's enforcement of FIFRA and found that the consumer had not been adequately protected. It pointed out that the Agency had not given its inspectors adequate guidance concerning what pesticides to sample. As a result inspectors repeatedly sampled some pesticides but not others. About 64 percent of the manufacturers in the three EPA regions surveyed had not had any of their products sampled during the four and one half year period examined. Customs had not reported the arrival of many

shipments of imported pesticides and the Agency did not adequately sample those reported. The report also found that the Agency's biological laboratories could not test most of the samples collected for safety and effectiveness because of limitations of space, personnel and equipment. Over an 18 month period, the Agency had collected 9,344 samples, but had tested only 19 percent for safety. Another criticism contained in the report concerned testing. In order to register a new product, the manufacturer is the party responsible for conducting tests concerning safety and efficacy; however the Agency does conduct some of its own tests. This is particularly true for those categories of products with a history of violations. The GAO criticized the Agency for not conducting more tests on products of this nature. Finally, the report mentioned other shortcomings including: Agency failure to consider enforcement alternatives such as cancelling registration and recalling products; failure to notify manufacturers when tests indicated that their products were defective; failure to act against the manufacturers of defective products; failure to notify the public about defective products; and failure to make full use of data supplied by states which pertained to the Agency's market surveillance programs.

A third GAO Report published in October 1974, concentrated on the safety of the pesticide maleic hydrazide and concluded that the EPA should require additional research on a registered pesticide when serious, unanswered questions of safety arise.¹⁰⁵ The report also pointed out that the FDA had never tested foods for residues of maleic hydrazide.

The GAO's criticism of the EPA was supplemented by that of the environmental groups. In testimony before Congressional committees they tended to support the Agency for its sincere efforts to implement the law, but they were, at the same time, critical of its performance in many areas. Some areas of criticism were: the handling of experimental permits and emergency exemptions; inadequate protection of farmworkers; permitting excessive pesticide residues in food; the quite complicated hearings necessary to cancel or suspend a pesticide registration; Agency failure to assign sufficient personnel to these hearings; failure to suspend the registration of more chemicals; failure to promulgate prescriptive regulations to regulate pesticide disposal; slowness in developing rules concerning child protective packaging; and inadequate monitoring of pesticide accidents.¹⁰⁶

Thus while farm and industry groups protested the stringency of federal pesticide regulation, information provided by environmental groups and the GAO indicated that the EPA's efforts had not been sufficient. In particular, the GAO had published several reports indicating that there were significant weaknesses in Agency efforts to protect man and the environment from the effects of harmful pesticides.¹⁰⁷ The reports did not make any recommendations for major changes in the law, but the information they provided would tend to suggest that if any changes in the law were needed, they should be changes oriented in the direction of a mandate from Congress for more stringent and effective enforcement. However the revision of FEPCA enacted by Congress in November 1975 tended to weaken, rather than strengthen, the Agency's ability to regulate pesticides.

1975: FIFRA revised. On May 1, 1975 the Senate Subcommittee on the Environment again held an oversight hearing on EPA's implementation of FIFRA. The hearing was very short and the discussion was environmentally oriented with only EPA representatives and environmentalists testifying.¹⁰⁸ Due to the fact that the authorization for FIFRA would expire fairly soon and the

House and Senate Agriculture committees were planning to hold hearings soon, it might have been appropriate for the Commerce subcommittee to hold more extensive hearings and to comment substantially on the subject of pesticide regulation. Had it done so the Senate subcommittee would have continued in the role it had assumed in 1972 of providing an environmental counter-force against the generally pro-industry and pro-farmer Agriculture Committees. By 1975, however, there had been a dissolution of the national consensus that had, in 1972, strongly supported environmental measures, and the subcommittee evidently felt no strong pressure to take more decisive action. Thus, unlike 1972, the 1975 revision of FIFRA fell solely within the jurisdiction of the House and Senate Agriculture committees with no substantial challenge or rivalry for input exerted by any other committee.

In May 1975, the Senate Subcommittee on Agricultural Research and General Legislation of the Committee on Agriculture and Forestry and the House Committee on Agriculture held hearings on FIFRA to consider the re-¹⁰⁹authorization of the Act. The primary participants in these hearings were farm, industry and environmental groups and Administration (EPA) representatives.

Among the participating farm and industrial groups the constant theme was that in balancing the risks and benefits of pesticide use, the EPA had given too much weight to health, safety and environmental considerations and not enough to the needs of agriculture. Among the environmental groups the message was the opposite. Each group made known its criticisms, but except for the environmental groups, most did not advocate any changes in the law. Instead they suggested that Congress give the Agency clear instructions concerning its intent in regard to the FIFRA legislation. The vehicle for these instructions was to be the legislative committee reports which were to be issued after the hearings.

In the hearings the farm groups focused on the problem of the certification of private applicators and in particular, the requirement for private applicators to pass a test. Under the 1972 FIFRA the EPA was directed to "classify" all pesticides into one of two categories - "restricted" or "general" use. The Act provided that after the deadline date of October 21, 1976 general use pesticides could be used by anyone and restricted chemicals (which were more dangerous) could only be used by a "certified" applicator. Applicators were to be certified by the States in which they lived and each State was

directed by the law to submit its plan for certification to the Administrator of the EPA for approval. Unless the Administrator approved the State plan for certifying applicators, the state was not authorized to certify. All certification plans were to be approved and all pesticides were to be classified as "general" or "restricted" use by October 21, 1976.¹¹⁰

There were considerable administrative problems associated with implementation of State certification programs, but the biggest problem was the provisions for testing of private applicators.

In their communications with the States concerning what would be acceptable standards for the certification of private applicators, EPA officials indicated that a typically acceptable plan would include provision for about one half day of classes and the subsequent administration of an oral or written test, so that it could be determined that the trainee had retained sufficient information to qualify him to use restricted pesticides.¹¹¹ The reaction against the idea of a test was strong and widespread. Every group representing farm interests which testified before the House and Senate committees criticized this proposed requirement. It was seen as an example of pervasive bureaucracy interfering with the

freedom of the farmer who was characterized as an ecologically conscious individual who was always very careful in the use of pesticides.¹¹² The farmers claimed that the EPA was administering the certification program in an inefficient manner. They urged that the committees in their reports direct it to clear up administrative problems and to refrain from the inclusion of a test in the standards for certification of private applicators. Instead, they proposed that the reports instruct the Agency that certification standards should be met by a system of self-certification, that is by having farmers complete a form at the time of purchase stating that they understood the precautions necessary to handle the pesticide being purchased. The idea of self-certification was also supported by the National Association of State Departments of Agriculture.

In their testimony all of the major industry groups urged a simple extension of the Act; however they did voice complaints which they urged Congress to resolve through the legislative report. Major complaints were that the EPA's testing requirements were too stringent and that the Agency's planned procedure for carefully examining suspicious chemicals was inefficient. Furthermore, it was urged that only a small percentage of

pesticides be classified as restricted. There was disagreement within the industry concerning the use by one manufacturer of data concerning pesticide health and safety which was generated by another manufacturer.¹¹³

The environmentalists urged a number of reforms. All of the environmental groups wanted repeal of the indemnity provision of the law which required that if a pesticide was suspended and then cancelled, the Administrator must either allow unused stocks of the chemical to be used up, or pay owners of the pesticide an amount of money equal to the cost of the unused stocks. It was argued that the requirement to make a large indemnity payment might discourage the EPA from suspending a pesticide, or it at least might encourage the Agency to allow the use of existing stocks of a suspended chemical which should be removed immediately from commerce. All the environmental groups also argued strongly for a stringent system of applicator certification and against the concept of self - certification advocated by the farmers.¹¹⁴

Other changes in the law sought by environmentalists included: legislative imposition of a deadline for EPA promulgation of regulations governing disposal of excess pesticides; a congressionally mandated deadline for rules concerning child protective packaging; a legal requirement

that no pesticide known to cause cancer in man or animals be registered; the stimulation of IPM development and application through economic incentives and education; and the inclusion of IPM principles in applicator certification training programs.¹¹⁵

Environmentalists also proposed that Congress, without enacting legal requirements, direct the Agency to do a full literature search of health and safety data in considering registration applications; to test all supposedly "inert" pesticide ingredients; to develop a workable reporting system for the collection of accident or adverse reaction reports; and to make more stringent the regulations concerning State registration of pesticides for special local needs.¹¹⁶

The Administration advocated a simple reauthorization of the Act.¹¹⁷ In response to criticism of the Agency the Administrator took a number of steps in the months prior to the final congressional vote. In order to ensure that he received the views of all interested parties, he set up a Pesticide Policy Advisory Panel and a State - Federal Implementation Committee. He instructed EPA Regional Administrators to seek closer cooperation with State agricultural officials, and he met with interested groups such as the American Association

of Pesticide Control Officials and the National Association of State Departments of Agriculture. In addition he formed an EPA Task Force to evaluate and improve the pesticide decision-making process.¹¹⁸

After the hearings, in August 1975 the Administrator decided to initiate proceedings to suspend the registration of heptachlor and chlordane. This caused a major reaction in Congress and among the chemical and agricultural lobbies.¹¹⁹ When the House Agriculture Committee held business meetings in September to come up with a bill, and when the Senate Agriculture Subcommittee held further hearings on FIFRA in October, the decision must have weighed heavily on the minds of the legislators because the industry and farm groups were given more by the committees than they had asked for. Although these groups had almost unanimously advocated a simple extension of funding for FIFRA, the House Committee on Agriculture drew up a bill aimed at supporting the goals of the farmers and industry. This bill included a requirement for consultation with the Secretary of Agriculture before issuing cancellation notices or regulations; a requirement for the conducting of economic analyses; a provision establishing a Scientific Advisory Panel; a requirement that the Agency accept self-

certification as a legitimate means of applicator certification and several other provisions. In the hearings held in October before the Senate Subcommittee on Agricultural Research and General Legislation, the environmentalists strongly criticized these provisions; however, with only minor revisions, they were approved by the Committee and by Congress and signed into law on November 28, 1975.¹²⁰

The new law was very much in accord with the needs of the farmers and industry. In the self-certification provision the farmers had received a legislative change for which they had hoped but had been afraid to ask. The law included virtually nothing that the environmentalists had wanted except a simple provision for the providing of IPM educational materials to those who were interested. It also included no provisions aimed at correcting the problems noted by the GAO. Thus in writing a law for industry and the farmers, Congress had almost completely ignored the input of the environmentalists and of its own GAO. As a basis for stringent EPA regulation, the law had been weakened. A brief outline will illustrate this point.

A primary provision of the revised law required the EPA Administrator to perform economic analyses and to

consult with the Secretary of Agriculture. In determining whether to begin the process of suspending, cancelling or changing the classification of a registered pesticide the Administrator was required to consider the effect of the proposed action on the production and prices of agricultural commodities, retail food prices, and otherwise on the agricultural economy. If he decided to take action to cancel, suspend or change a classification he was required to inform the Secretary of Agriculture of his intent and to provide the Secretary with an analysis of the impact the action would have on the agricultural economy. The Secretary had to be informed and given a copy of the economic analysis at least 60 days prior to the Administrator's planned action. The Secretary then had 30 days in which to respond. The Administrator was required to publish in the Federal Register: the original notice of intent to cancel, suspend or change a classification; the comments of the Secretary and the response of the Administrator to the Secretary's comments. Not only was an economic analysis required at the beginning of the cancellation, suspension or reclassification process, the law also specified that in taking any final action to cancel or change the classification of a pesticide, the economic impact of that action must be analyzed and

published in the Federal Register.¹²¹

The legislation also provided that if the Administrator determined that suspension of a pesticide registration was necessary to prevent an imminent hazard to human health, he could waive the requirement of notice to and consultation with the Secretary of Agriculture. He could not waive the requirement if there existed only an imminent hazard to the environment. Thus that portion of the 1972 law which had provided for a quick suspension process to deal with any "imminent hazard" was now restricted to imminent hazards to human health.¹²²

The law also provided that all proposed and final EPA pesticide regulations be submitted to the Secretary of Agriculture for comment. The proposed or final regulation, the Secretary's comments and the Agency's reply were then to be printed in the Federal Register. Proposed and final regulations were also to be submitted to the Agriculture Committees of Congress.¹²³

The new requirements for consultation with the Secretary of Agriculture were the result of an original proposal which would have given the Secretary the authority to veto cancellation and suspension decisions and new regulations made by the Administrator. This proposal, introduced by Congressmen Poage and Wampler,

had to be voted down once in committee and twice on the floor of the House, and the first House vote was surprisingly close (167-175). If the measure had passed, the authority of the Administrator to regulate pesticides would have been almost completely undermined.¹²⁴

Another major change gave the farmers what they had asked for concerning the training of private applicators of restricted use pesticides. The Congress changed the law so that the EPA could not require that the States make the taking of an examination a requirement for private applicator certification. The certification standard for a private applicator was to be deemed fulfilled by his completing a certification form. The Administrator was permitted to include a requirement that this form contain an affirmation that the private applicator had completed an approved training program, so long as the program did not require the applicator to take any examination to establish competency in the use of a pesticide. If the individual States wanted to require private applicators to take an examination they could do so, but the EPA could not disapprove a State Plan for the certification of private applicators because it lacked a requirement that a test be taken. Thus a federal requirement for the testing of private

applicators was precluded by law.¹²⁵ Almost all of the States had been against the requirement for testing, so most private applicators of restricted pesticides throughout the country would be able to use these chemicals without ever having passed a test to establish their competence. In short, the farmers had gotten through legislation what they had asked Congress to give them through instructions to the EPA.

The 1975 law also set up a Scientific Advisory Panel (SAP) consisting of seven members. The administrator was required to submit planned suspensions, cancellations and reclassifications, and proposed and final regulations to the panel for comment as to the impact of the proposed action on health and the environment. The comments of the panel and the Administrator's reply were to be published in the Federal Register. The same time requirements as provided for the Administrator to inform the Secretary of Agriculture of these types of actions, and for the Secretary to respond, applied to the Advisory Panel. In a similar manner, if suspension was necessary in order to prevent an imminent hazard to human health (but not to the environment) the requirement for solicitation of the panel's comments was waived.¹²⁶

The law did contain what appears to be a nod to the environmentalists. It provided that in developing the standards for the certification of applicators of restricted pesticides, provisions should be included for making instructional materials concerning IPM available to interested individuals at their request. It also required that these people be notified of the availability of this material. The law specified, however, that applicator certification standards could not require that any individual receive instruction concerning IPM techniques or be shown to be competent with respect to their use.¹²⁷

The law also extended certain deadlines. The deadlines for reregistration and reclassification of pesticides registered under the pre-1972 FIFRA was extended for one year to October 1977 as was the final date for certifying applicators. The States were given an extra year to submit plans for the certification of applicators and any requirement that a pesticide be registered for use only by a certified applicator was put off for one year until October 1977. The deadline for all regulations to be established under the law was extended one year to October 1977.¹²⁸

Finally several other changes included: revised rules for the handling of compensation for the use of industry generated pesticide safety test data, a change in the definition of "pesticide," and slightly revised procedures concerning the issuing of experimental use permits and emergency exemptions from the regulations governing the use of pesticides.¹²⁹

The basic thrust of the 1975 legislation was to weaken FIFRA as a means of providing environmental protection. The law had been weakened in two ways. First the provision for self-certification of applicators allowed applicators of restricted pesticides to be certified without ever passing a test to demonstrate competence. Second, the combined effect of provisions for consultation with the Secretary of Agriculture, economic analyses, consultation with a Science Advisory Panel, and informing the Agriculture committees about rules was to make an already complicated law and administrative process even more complicated. As Congressman Brown of California noted in debate on the House floor,

Despite the protestations of every member of this House that we want a simple, economical administration, we have put into this bill the most complicated system of mandatory consultation at every step of the regulatory process that can

be imagined, which will add immeasurably to both the time and the cost of the EPA's regulatory activities.

That, of course, was the purpose of putting it in the bill.¹³⁰

1976: Some Critical Reports and
A Vetoes Veto

A restrained and disorganized EPA. By late 1975 Administrator Train was appealing to the OMB for the restoration of funds and positions which had been reduced in OMB's revision of the budget for the entire Agency.¹³¹ The Agency's budget problems, the fact that Congress had recently weakened FIFRA, and the close Congressional vote on the proposal to give the Secretary of Agriculture veto power apparently weakened the resolve of senior EPA officials. By 1976 the Agency had become noticeably more restrained, not only in the regulation of pesticides but in other areas of regulation.

The Agency's restraint led to protest from its own personnel. In February 1976, three of its pesticide lawyers resigned in protest over its failure to take effective action under its existing authority. The lawyers felt that the Agency was clearly backing away from a rigorous enforcement attitude. Some of the particular actions protested were the removal of

significant decision-making authority from the legal staff and the institution of a costly and time consuming means of deciding whether or not to initiate cancellation actions against pesticides suspected of causing harm. This process, called the "Rebuttable Presumption Against Registration" (or RPAR) process, was a very complicated administrative procedure which, they felt, was designed to slow down the regulatory process.¹³²

Two months later five EPA employees testified at a Senate Subcommittee on Health hearing. They complained about the Agency's failure to take action against dangerous chemicals, its poor organization and inadequate resources, and its failure to carefully examine health and safety test data submitted for the purpose of registering chemicals.¹³³

The Agency's restraint was examined in hearings held in April 1976 by Congressman John E. Moss's Subcommittee on Oversight and Investigation. Congressman Moss noted that: "In recent months a number of EPA decisions betray a degree of restraint seemingly uncharacteristic of an agency fully committed to an aggressive pursuit of its statutory mandate to protect the public health."¹³⁴ The Congressman suggested that the source

of this restraint might be executive branch pressure.¹³⁵

The year 1976 was marked by a legislative attempt to modify FIFRA which was vetoed by President Ford, and numerous hearings and governmental reports.¹³⁶ Hearings were held by: the House Subcommittee on Conservation Energy and Natural Resources of the Committee on Government Operations; the Senate Subcommittee on Agricultural Research and General Legislation of the Committee on Agriculture and Forestry; and the House Committee on Agriculture.¹³⁷ The Senate Subcommittee on Health of the Committee on Labor and Public Welfare and the Subcommittee on Administrative Practice and Procedure of the Committee on the Judiciary held joint hearings, and the House Subcommittee on Oversight and Investigations of the Committee on Interstate and Foreign Commerce dealt with pesticides in two different sets of hearings.¹³⁸

A report dealing with pesticides along with other areas of federal regulation was produced by the House Subcommittee on Oversight and Investigations and a thorough report dealing only with pesticide regulation was prepared by the House Subcommittee on Administrative Practice and Procedure.¹³⁹ An extensive GAO report was produced in December 1975 and a shorter GAO report came out the following month.¹⁴⁰ In February 1976 the

National Academy of Sciences released a five volume study on present and alternative pest control technologies.¹⁴¹

Thus much information concerning the federal regulation of pesticides was generated in 1976. The dominant theme of most of these reports and hearings was that the EPA's regulation of pesticides was too easy on the pesticide industry and farmers, inadequate to protect public health, poorly planned and managed, and inadequately supported in terms of funds and personnel.

The National Academy of Sciences noted that the pest control enterprise placed a billion pounds of toxic materials into the environment each year, but it was not known how much of each compound was used and where. The Academy suggested that surveys of pesticide use be increased and methodologies improved.¹⁴² It was also pointed out that because insect resistance to insecticides was growing, more attention should be paid by concerned agencies to the development of alternative means of pest control including integrated control strategies.¹⁴³

The testimony of hearing witnesses criticized Agency decisions to permit residues of what they considered dangerous pesticides to be left on food.¹⁴⁴ The use of risk - benefits analysis in making pesticide registration decisions was criticized in the report of

the subcommittee on Oversight and Investigation. The report also pointed out that the Agency's risk - benefit calculations failed to take into account the costs of cancer and the environmental degradation caused by pesticides.¹⁴⁵

A central focus of criticism was EPA's management of its pesticide regulatory effort. Testimony indicating poor organization and morale was presented in the Subcommittee on Health hearings.¹⁴⁶ A Senate hearing investigating the kepone poisoning of pesticide production plant workers uncovered inefficiency in the flow of data between the Agency and other agencies regulating toxic chemicals.¹⁴⁷ However the central management problem was one which has persisted to the present day. It concerned the EPA's handling of registration data. Under the 1972 FIFRA the Agency was required to promulgate regulations providing for the registration and classification of pesticides. The Act required that these regulations be promulgated within two years, that is by October 1974.¹⁴⁸ The regulations were finalized ten months late in August 1975.¹⁴⁹ Thereafter all pesticides would be registered under these new regulations. Under these rules, manufacturers wishing to register a new pesticide were required to submit to the Agency a fairly

extensive amount of test data concerning its efficacy, its effects on the environment, and its effects on human health. The types of tests which were required were described in guidelines and the responsibility for conducting these extensive and costly tests was assigned to the manufacturer. He could perform the tests himself or he could pay an independent laboratory to perform the tests for him. Many manufacturers had a laboratory do their testing.

The intent of FIFRA and the rules implementing it was that the Agency would examine the test data which had been submitted along with the application for a new registration. If the data indicated that there was little possibility that the chemical could have "unreasonable adverse effects" it would be registered. If the chemical was found to have an unreasonable adverse effect (that is, the costs of its use outweighed the benefits) the application for registration would be denied.¹⁵⁰

When the EPA became responsible for pesticides, it inherited responsibility for thousands of chemicals which had been registered with the Department of Agriculture under less stringent regulations. The law required that these and all pesticides registered before the effective

date of the August 1975 regulations be reregistered on the basis of the new, more stringent regulations. The deadline established in the law for the completion of this task, was October 1976.¹⁵¹ This deadline was extended to October 1977 by the 1975 revision to FIFRA.¹⁵²

The reregistration task was tremendous, the total number of products in need of reregistration being about 35,000.¹⁵³ The extensive data supporting each of these thousands of old pesticide registrations had to be carefully screened to see what tests would be needed to conform to the new, more extensive data requirements and to determine what tests would have to be done again with newer, more accurate testing methods. This task would have been difficult even if the records transferred from USDA had been in order, but most of the millions of documents received from Agriculture were unsorted.

It became increasingly apparent in 1976 that the pesticide registration and reregistration effort was not going well. The December 1975 GAO study noted that registrants had not submitted required studies for many registered pesticides. It also noted that the Agency was not requiring the full range of data to support registration because of limited staff and time. Data not required included mutagenicity and environmental

chemistry studies. Because of these and other problems related to the administration of FIFRA the report concluded that " . . . the American consumer has not been adequately protected from the potential hazards of pesticide use"154

Testimony of an EPA employee in April 1976 indicated that the pressure to meet the reregistration deadline was inhibiting a comprehensive evaluation of safety. The reregistration process was like an assembly line in which one felt that under pressure there was not time to ask many questions.¹⁵⁵ This was confirmed by the report of the Subcommittee on Administrative Practice and Procedure in December 1976 which concluded that a decision had been made within EPA that in reregistering pesticides, the applicable test data would merely be catalogued, and not checked for validity. If test data was missing, the registrant was to be informed of what data was needed and given an opportunity to submit it. If all data was present the product was reregistered. There was taking place no check of the quality of the test data underlying reregistrations. The report maintained that much of this data was poor in quality.¹⁵⁶

A report prepared in 1976 by a consultant to the EPA looked at the quality of lab tests submitted to the

Agency on 23 pesticides. The reviewer concluded that most of the data was bad and that perhaps one study was satisfactory.¹⁵⁷ All this demonstrated that, at best, the pesticide industry had not been submitting very high quality data and that, consequently, much of the data on which pesticides were registered (and thus assumed to be safe) was poor in quality. The system of registration was not providing the measure of safety it was designed to provide and which it had appeared to provide. In Senate hearings during 1976, Administrator Train admitted in answering a question asked by Senator Kennedy, that it was not known whether or not those pesticides which had been approved were really safe.¹⁵⁸

The Senate Subcommittee Report noted that the Agency had insufficient resources to carry out reregistration but faulted it for not telling Congress about the problem. As early as 1973 the Registration Division of the Office of Pesticide Programs had asked for 100 extra people to complete reregistration, but the request was disapproved by the OMB. In the budget review for fiscal 1975 it was decided that only 15 or 20 extra people would be assigned.¹⁵⁹ The net effect of the problems noted in the report was " . . . the probability that many of these pesticide products now on the market would be found to be

unsafe if EPA regulated pesticides the way it is required to under the law."¹⁶⁰

The Agency did start a program to validate data and another to audit safety test results. It also took several other steps designed to correct its registration difficulties but to this date, the registration and re-registration of pesticides remains a problem.¹⁶¹

The essence of the reports and hearings looking at pesticides in 1976 can be summarized in the conclusion of a House subcommittee report:

In sum, in its regulation of pesticides, EPA is failing to perform its mandate to protect the public. EPA's developing pesticide program is increasingly solicitous of the pesticide industry at the expense of the public health and well-being. It is EPA's job to protect and enhance the quality of the environment. Its permissive regulation of pesticides threatens, instead, to degrade environmental quality.¹⁶²

A presidential veto. Thus the overwhelming tendency of the reports and testimony in hearings in 1976 was to support the assumption that in its regulation of pesticides, the EPA was too easy on the industry. There was, however, one exception to this tendency. The House Committee on Agriculture provided strong criticism of the Agency for being too stringent. The funding authorization for FIFRA was going to terminate on

March 31, 1977 so the Committee held a short hearing in April 1976 with the intention of extending the authorization for six months. (It was planned that possible revisions to the law would be considered in more extensive hearings to be held at a later date.) The April hearing focused merely on the extension of the authorization and provided a forum in which Congressmen criticized the Agency for: its policy on mirex, a chemical used to control the fire ant; its regulation of 2,4,5T; and its decision the previous year to ban the chemicals heptachlor and chlordane.¹⁶³ One legislator also criticized Deputy Assistant Administrator John Quarles for a speech he had recently made in which he had noted that American business had resources for lobbying superior to those of public interest groups.¹⁶⁴

The hearing produced a bill authorizing a six month extension of FIFRA. No other changes in the basic legislation were included. In the Committee's markup session Congressman Dawson Mathis proposed an amendment to provide that no regulation under FIFRA issued by the EPA be effective if either the House of Representatives or the Senate voted to reject it. This "legislative veto" amendment was defeated in the Committee 18 to 16.¹⁶⁵

When the legislation came up on the House floor in

August, Congressman Mathis again offered his amendment. After floor debate in which Congressman Eckhardt pointed out that such a measure would favor those who can afford to maintain lobby groups in Washington, the measure passed by a vote of 347 to 33.¹⁶⁶ Two days later it passed the Senate without debate.¹⁶⁷ On August 13, the President vetoed the bill stating that it was unconstitutional because:

1. It was contrary to the general principle of separation of power whereby Congress enacts laws but the President and the agencies of government execute them.
2. It violated Article I, section 7 of the Constitution which requires that resolutions having the force of law be sent to the President for his signature or veto.¹⁶⁸

The President noted that the Congress had been considering bills of this kind in increasing number and expressed the hope that it would pass a bill without a legislative veto provision.¹⁶⁹

1977-1978: FIFRA Revised Again

More criticism of pesticide regulation. In 1977 and 1978 there continued to be a high level of activity aimed at generating information about pesticides and their regulation. In addition to the legislative hearings on the revision of FIFRA, hearings were held by a Senate Agriculture subcommittee on the safety of food which contained residues of agricultural chemicals.¹⁷⁰ This subcommittee also held hearings on integrated pest management and worker safety in pesticide production.¹⁷¹ Senator Edward Kennedy's Subcommittee on Health and Scientific Research held hearings which included a look at pesticide residues in breast milk and a House subcommittee under Congressman John E. Moss examined pesticide residues in food.¹⁷² The results of a GAO study which followed up the earlier GAO report of December 1975 were reported to Congressman Moss's subcommittee in testimony.¹⁷³ The study concluded that problems noted in the earlier report concerning the EPA's regulation of pesticide residues in food had, for the most part, not been corrected.¹⁷⁴ A short GAO report in April, 1978 indicated that the EPA was not properly enforcing the requirement of FIFRA that it notify foreign governments when a pesticide registration

175
was cancelled.

A lengthy GAO report produced in January 1978 focused on special pesticide registration, that is, registration under those sections of FIFRA which allow for:

1. "Experimental Use Permits" which authorize the use of an unregistered pesticide under controlled conditions in order to acquire test data needed to register it.
2. "Emergency Exemptions" which are granted to state and federal agencies in order to meet emergency conditions such as the uncontrolled outbreak of a pest. An emergency exemption allows the federal or state agency to use an unregistered pesticide or a registered pesticide for a use for which it is not normally registered.
3. State registrations. Under certain circumstances the states were permitted to register pesticides for special local needs. These registrations could be disapproved by the
176
EPA.

The report concluded that all three programs were poorly administered and described many deficiencies. For example it was found that the Agency took too long

to process applications for experimental use permits and emergency exemptions and that emergency exemption requests were often approved for use in non-emergency situations. It was reported that states had misused their registration authority by registering ingredients that the EPA had previously suspended or cancelled and by registering pesticides that the Agency had ordered them not to register because of unreasonable adverse effects or the lack of safety or efficacy data.¹⁷⁷

In late 1977 the National Academy of Sciences released a report titled Pesticide Decision Making.¹⁷⁸ The report, which was part of a series of reports done for the EPA, focused in particular on the Agency's scientific strengths and weaknesses. Its main theme was that more and better science was needed. It called for more scientists in top level positions and better coordination of research. A number of administrative changes were recommended, many of them having to do with information management. Finally it suggested a number of changes concerning the making of decisions and the accumulation of information on which decisions were based. It recommended more cooperation with the USDA and argued that some scientific studies required by the Agency were not always necessary. It also suggested that

the National Pesticide Monitoring Program, which monitors the levels of chemical residues in the environment, should be better led and coordinated by the EPA.¹⁷⁹ EPA administrator Douglas Costle reacted quickly to the report by beginning immediately the development of a plan to implement its recommendations.¹⁸⁰

FIFRA revised. By 1977, state officials were asking for more authority to regulate pesticides.¹⁸¹ This and several other issues shaped the discussion of FIFRA revision. The most important of these issues, by far, was the problem of reregistration and many were calling for legislative action to resolve this problem. The report by Senator Kennedy's subcommittee had slowed down an already slow process because now, instead of just checking for the presence of pesticide testing data, reviewers were having to check the data for validity. Furthermore, by 1977 a substantial number of disagreements had arisen concerning the use of one manufacturer's safety testing data by another. Under the law a company wishing to register a pesticide could either do all of the required testing itself or, if another company had already registered the same chemical, refer to the data of that company and pay it reasonable compensation for the use of its

¹⁸² data. However that data which was defined as a "trade secret" could not be considered by the EPA in support of another company's registration unless permission to do so was given by the data originator.¹⁸³ The problem was that Congress had not clearly defined the term "trade secret." Thus some data developers were claiming that all of their health and safety data were trade secrets. By June 1977, fifteen plaintiffs had filed suit in federal courts to prevent the EPA from disclosing data which the companies claimed were trade secrets.¹⁸⁴ Because of this logjam of litigation, the need to carefully check the validity of data, and EPA mismanagement, the reregistration process was at a standstill and both farmers and industry looked to Congress to get the process moving.

Legislation to reauthorize funding for FIFRA and to make a number of changes to the law was examined in hearings in 1977.¹⁸⁵ A bill passed the Senate in July and a different bill passed the House in October.¹⁸⁶ The House bill included, again, a provision for legislative veto of EPA rules which was added on the House floor.¹⁸⁷ The conferees could not agree and did not reach agreement until July 1978 after they had met eight times. The conference bill, which deleted the legislative veto, was passed and became law the following September.

As a basis for regulation which would protect public health and the environment while allowing for a reasonable level of agricultural activity, the law was weakened.

Perhaps the most controversial aspect of the new law was the provision for conditional registration of pesticides.¹⁸⁸ This meant that new pesticides and new uses of already registered pesticides could be registered by the Agency if some of the data which had been required to support registration was missing. The missing data would have to be submitted to the Agency within a reasonable period of time. The Agency argued that conditional registration would not permit the use of unsafe chemicals.

Environmentalists argued against conditional registration claiming that the completion of all tests was the only way to ensure that a substance was safe.¹⁸⁹ In the debate

on the passage of the legislation Congressman John Moss argued strongly against conditional registration. Moss claimed that allowing it might permit the sale of unsafe pesticides which would leave harmful residues on food.

Pesticide residues on food was a subject under the jurisdiction of Moss's Subcommittee on Oversight and Investigation so the Congressman tried to have FIFRA referred to his subcommittee, but the subcommittee never reviewed the

¹⁹⁰
law.

The other main aspect of the bill which weakened it was its assignment of primary enforcement responsibility for pesticide use violations to the states.¹⁹¹ Henceforth the EPA would continue such activities as approving or disapproving application for registration of pesticides and setting tolerances for the maximum allowable pesticide residues on food, but the states would have primary responsibility for such use violations as the use of an unregistered pesticide or the use of a restricted pesticide by someone who was not a certified applicator. The assignment of responsibility to the states had to be approved by the Administrator who was required to determine that the laws, regulations and procedures of each state were adequate. Assignment of primary enforcement responsibility to the states was sure to lead to less stringent regulation. In their hearing testimony state officials have usually advocated less stringent regulation and have often referred to, what they consider, the EPA's excessive degree of regulation.¹⁹²

Continuing the trend begun in 1975, the Congress also added a number of minor changes to the law which tended to make the Agency's job more difficult. If looked at individually these changes were not particularly significant, but when considered with the 1975 amendments

and in the context of an already very complex law, the changes tended to add considerably to the Agency's work burden. Thus the Administrator was not permitted to begin pre-cancellation proceedings unless a validated test indicated possible harmful effects.¹⁹³ In forming regulations the Agency was directed to consider the effects of the regulations on production and prices.¹⁹⁴ Before cancelling a pesticide the Administrator was required to consider restricting its use as an alternative to cancellation.¹⁹⁵ Finally, he was required to solicit from the Agency's Science Advisory Panel guidelines for improving the Agency's scientific analyses.¹⁹⁶

Although the law was weakened, the movement was not completely in that direction: For example the statute clarified the point that experimental use permits could only be issued if needed to accumulate information required to support registration.¹⁹⁷ A provision relating to trade secrets made it easier for the public to inspect safety data.¹⁹⁸ Another provision was designed to ensure that the foreign purchaser of an unregistered pesticide understood that the chemical was not registered for use in the United States.¹⁹⁹

A number of other changes had little to do with stringency of regulation and pertained to administrative

matters. Changes were made which facilitated a new system of pesticide registration called generic registration.²⁰⁰ The Agency hoped that this system would help it to clear up its backlog of registrations.

Another change allowed the Agency to waive testing requirements pertaining to pesticide efficacy thereby permitting it to concentrate on health and environmental data.²⁰¹

The very large problem of compensation by one manufacturer for the use of another's health and environmental testing data was addressed by changes in the law which altered the standards for compensation and by a new, more precise definition of trade secrets.²⁰²

This part of the legislation was the result of much effort, the problem of compensation for the use of data having been almost the only topic discussed at the House hearings in April and June of 1977.²⁰³

In revising FIFRA, Congress had paid only slight attention to the suggestions of the environmental groups. As has been pointed out, the law was strengthened in some relatively minor ways but no changes which would have made it substantially more environmentally oriented were adopted. Furthermore the change which defined trade secrets was aimed at least as much at permitting the Administrator to get on with the registration of pesti-

cides as it was with meeting the demands of environmentalists that they be allowed to inspect industry generated safety data. On the controversial issues on which industry and farm groups took a strong stand, the environmentalists consistently lost. For example conditional registration was approved over their objections. Furthermore many suggestions made by these groups which might have improved the regulation of pesticides were not even seriously considered. Their concerns never even became issues debated and examined by the legislators. Some of the ignored recommendations were:

1. Repealing the FIFRA provision requiring that the government pay an indemnity to owners of pesticides whose registration was cancelled, if the government did not allow the sale of existing stocks.²⁰⁴
2. Consideration of the testing of so-called "inert" ingredients in pesticides. These ingredients normally have no pesticidal effect but it has been argued that some may be harmful to humans.²⁰⁵
3. Consideration of swifter ways to revoke the registration of dangerous pesticides including ways to expedite the Agency's pre-cancellation

screening (or RPAR) process and the final
cancellation process.²⁰⁶

4. Consideration of the establishment of public testing laboratories to which manufacturers could submit their products to be tested for a fee.²⁰⁷
5. Consideration of steps to more strongly support the development of Integrated Pest Management technology.²⁰⁸
6. Providing a clear directive from the Congress to the EPA that it should give the highest priority to the protection of human health and environmental quality.²⁰⁹

In revising the law in 1978 Congress weakened it substantially and strengthened it only slightly. The movement in the direction of less environmental protection was marked by an occasional minor victory for the environmentalists, but the general trend was toward a weaker law.

1979-1980 Legislative Veto
and More Scientific Input

Another change to FIFRA. The legislative authorization for FIFRA has always been for a relatively short period of time. It was scheduled to expire in September 1979 so new reauthorizing legislation was needed. Legislation amending FIFRA was passed by the House in 1979, but because of a disagreement with the Senate, no law was enacted that year. In 1980 after considerable efforts an amendment was finally passed.

The most important topics of discussion during this period were: the requirements for the protection of test data, stricter state requirements, the spraying of mirex for control of the fire ant, the legislative veto, and the question of how much scientific input to FIFRA was needed.

Disputes continued concerning the compensation of companies which produced pesticide safety testing data needed for registration by other companies desiring to refer to the safety data in order to register their own identical products. Furthermore there continued to be disagreement concerning what data was a trade secret. All this was complicated by the new system of handling

pesticide registration begun by the EPA. The lawsuits generated by these problems threatened to significantly slow down the registration of pesticides.²¹⁰ An attempt was made to provide a legislative solution to the problem of compensation for the use of data, but at the last minute, the industry coalition supporting the change²¹¹ broke down.

California enacted some pesticide regulatory measures which were stronger than the federal pesticide requirements. This was an unusual event because state regulation is, as a rule, weak and very much dominated by farming interests. The unusual development in California was accompanied by an unusual ideological shift on the part of some industry people and legislators away from an avid state's rights stance. In their testimony at hearings on FIFRA several industry people complained about the California regulations and suggested that Congress review the division of authority between the state and federal governments, however the legislators did not find the time to become involved with²¹² this problem.

In 1979, the full Agriculture Committee added a provision to the proposed FIFRA amendment which would have allowed the use of the pesticide mirex to control

the fire ant. The registration of mirex had been cancelled by the EPA because it felt that the risk presented by this chemical to human health outweighed the benefits of its use. The proposed legislation was an attempt by its sponsors to override the risk - benefit decision making delegated by FIFRA to the EPA. In place of the Agency's complicated decision making process, which involved both a political judgment and the consideration of volumes of scientific data, the Congress would have made an almost purely political decision. There had been no hearings held on the subject, so there had been comparatively little Congressional discussion of the scientific aspects of the problem. If passed, the mirex provision would have set a precedent for legislative intervention in any Agency pesticide decision. The measure was defeated, but only after an extensive and sometimes emotional debate on the House floor and the threat of an Administration veto.²¹³ Although it was defeated, its support by the full House Agriculture Committee indicated the Committee's willingness to intervene in EPA risk - benefit decision making on the side of the farmer and manufacturer and against the public health.

The problem of scientific input into EPA decisions

was extensively discussed. This problem involves two opposing needs. On the one hand decisions must be grounded as firmly as possible in an accurate understanding of the relevant scientific facts. This supports the making of fair decisions which are defensible in court. On the other hand, the protection of public health and the environment requires timely decisions. One rarely sees a scientific study related to pesticides which does not suggest that more studies are needed, but spending large amounts of time waiting for more studies to be completed or complying with many complicated procedural requirements for peer review and consultation may delay a needed regulatory action. In fact it can be argued (and it is argued throughout this dissertation) that one way of weakening the law is to place so many procedural requirements (both administrative and scientific) on its administrators that they are able to accomplish less, given the finite resources of money and personnel available to them.

In 1980 Congress added two more requirements to the already complicated FIFRA regulatory mechanism. The event that precipitated this action was the suspension of the herbicide 2,4,5T in February 1979 after an epidemiological study indicated that 2,4,5T might be the

cause of miscarriages.²¹⁴ Congressman William C. Wampler argued that the Agency's decision was based on a poor study and should have been reviewed by a panel of scientists. The outgrowth of his concern was an amendment which required that the Agency's Science Advisory Panel review all suspensions of pesticide registrations after they became effective, and a requirement that the Administrator provide for peer review of all major scientific studies conducted under FIFRA.²¹⁵

Congressman Wampler had wanted the peer review provision to apply to "all" scientific studies, however his original proposal was modified to meet the objections of some committee members.²¹⁶

The subject of legislative veto again arose. A provision in the FIFRA reauthorization bill which provided for a veto by either House of Congress of any EPA regulation promulgated under FIFRA was approved in the House Agriculture Committee and passed by the House in 1979.²¹⁷ Its presence in the bill led to a disagreement with the Senate which stood firmly against it. It was not possible to reach an agreement in the House - Senate Conference and so the authorizing legislation for FIFRA expired in September 1979. The regulation of pesticides continued, however, because sufficient funds were

appropriated. The inability to reach agreement with the Senate led to the introduction of a new proposed re-authorization of FIFRA in the House in 1980 which did not contain a legislative veto provision. This bill was approved by the full Agriculture committee, but defeated on the House floor by the advocates of legislative²¹⁸ veto. Several days later the same bill passed when a legislative veto provision was added.²¹⁹ The final bill included a compromise with the Senate which required that both Houses (not just one) disapprove regulations. The compromise also provided for the judicial review of the constitutionality of this provision.²²⁰

To summarize, the final bill reauthorizing FIFRA signed by the President in December 1980 contained provisions for: legislative veto, peer review of major scientific studies, and Science Advisory Panel review of pesticide registration suspensions. The bill authorized funds only to September 1981 in accordance with the Agriculture Committee's wish to authorize only for one²²¹ year at a time. On signing the bill the President noted his opinion that the legislative veto provision was unconstitutional. He further stated that the executive branch would not consider an expression of disapproval²²² under this provision to be legally binding.

Again the amendment to FIFRA and the House and Senate Agriculture Committee hearings preceding its passage paid little attention to much useful information generated in reports and in other congressional committees. This information indicated that the EPA was doing a less than satisfactory job of protecting the public health. Three GAO reports had uncovered major problems in: the export of pesticides, the examination of domestic meat and imported foods for illegal pesticide residues, the registration of pesticides, decision-making on hazardous chemicals, and the use of laboratory inspection results.²²³ Hearings held by a subcommittee of the House Committee on Interstate and Foreign Commerce had uncovered serious problems concerning the pesticide exposure of farmworkers, the exposure of residents of rural communities to pesticide spray drift from nearby fields, and the adverse health effects resulting from this exposure.²²⁴

FIFRA in 1980. In summary pesticide regulation from 1910 to 1980 has moved from an area of almost exclusive concern with protection of the farmer consumer from defective products to a struggle between environmental interests on the one hand, and farm and pesticide manu-

facturing interests on the other. The turning points in this policy evolution were in 1970 when the EPA took over administration of FIFRA from the USDA and in 1972 with the passage of the new FIFRA. These events were preceded by years of reports, hearings and books describing the harmful affects of pesticides.

The USDA had been an organization primarily organized to support its farmer constituents who had little interest in stringent pesticide regulation. Consequently it was not surprising that it provided a much less than enthusiastic regulatory effort. The EPA was an organization devoted primarily to environmental protection, but this orientation was severely inhibited by the many technical pesticide experts within the Agency who had been transferred there from Agriculture, and by Congress.

While the environmentally oriented Agency had become the primary regulator of pesticides, the farmer oriented Agriculture committees of Congress had retained primary control over FIFRA. These committees had weakened the proposed 1972 FIFRA, successfully supported weakening amendments in 1975, 1978, and 1980, and exerted constant Congressional pressure on the EPA. This pressure was facilitated by authorizing money for relatively short periods of time, thus assuring that

Agency officials would have to frequently justify their actions in hearings.

The law had been weakened both by passage of specific provisions, such as conditional registration or giving the states primary enforcement responsibility for use violations, and by adding many complicating procedural requirements to an already very complicated piece of legislation. Some small environmental tokens, such as the provision of IPM educational materials, were also included in the revisions.

The law as it has evolved up to 1980 does contain, with all its weaknesses, a criterion and a structure for removing at least the most harmful pesticides from use. A more environmentally oriented and efficient EPA might have provided more stringent regulation utilizing this structure, but without provisions, such as establishing pest control districts, aimed at reducing the overall use of pesticides, FIFRA can (even with the best adminis-²²⁵tration) provide only limited environmental protection. This complicated legal structure permits the removal from commerce of only a few harmful chemicals at a time.

NOTES TO CHAPTER III

¹ U.S., Congress, Senate, Committee on Agriculture, Nutrition and Forestry, Federal Pesticide Act of 1978, Committee Print (Washington, D.C.: Government Printing Office, 1979).

² Ibid., p. 189; Statutes at Large 36, 331 (1910).

³ U.S., Congress, House, Committee on Agriculture, Federal Insecticide, Fungicide, and Rodenticide Act, Hearings Before the Committee. 95th Cong., 1st sess., 1977, p. 518.

⁴ John E. Blodgett, "Pesticides. Regulation of an Evolving Technology," in The Legislation of Product Safety, Volume 2. Consumer Health and Product Hazards - Cosmetics and Drugs, Pesticides, Food Additives, eds. Samuel S. Epstein and Richard D. Grundy (Cambridge, Massachusetts: The MIT Press, 1974), p. 206. Much of this description of the history of pesticide regulation is based on this article.

⁵ Ibid., p. 206; Statutes at Large 52, 1040 (1938).

⁶ Blodgett, pp. 206-207; U.S., Congress, Senate, Committee on Agriculture, Nutrition and Forestry, Food Safety: Where Are We?, Committee Print, (Washington, D.C.: Government Printing Office, 1979), pp. 69-70.

⁷ Blodgett, p. 207.

⁸ Ibid., p. 207.

⁹ U.S., Congress, Federal Pesticide Act of 1978, p. 190.

- ¹⁰U.S., Congress, Federal Insecticide, Fungicide, and Rodenticide Act, Hearings 1977, p. 518;
U.S., Congress, Federal Pesticide Act of 1978, p. 190.
- ¹¹U.S., Congress, Federal Insecticide, Fungicide, and Rodenticide Act, Hearings 1977, p. 518.
- ¹²Blodgett, p. 208.
- ¹³U.S., Congress, Federal Insecticide, Fungicide, and Rodenticide Act, Hearings 1977, p. 518.
- ¹⁴The significance of these reports is discussed in U.S., Congress, Food Safety , 1977, p. 71.
- ¹⁵Statutes at Large 68, 511 (1954).
- ¹⁶The FDA was by this time part of the Department of Health, Education and Welfare; Blodgett, p. 209; U.S., Congress, Food Safety , p. 71.
- ¹⁷U.S., Congress, Food Safety , pp. 71-72.
- ¹⁸Blodgett, p. 209.
- ¹⁹U.S. Code, vol. 21, sec. 346 a. (1976).
- ²⁰Blodgett, p. 210.
- ²¹Ibid., p. 212; U.S., Congress, Food Safety ,
p. 72.
- ²²Blodgett, p. 212.
- ²³U.S., Congress, Federal Insecticide, Fungicide, and Rodenticide Act, Hearings 1977, p. 519.
- ²⁴Nematocide, Plant Regulator, Defoliant, and Dessicant Amendment of 1959, Statutes at Large 73, 286 (1959); U.S., Congress, Federal Pesticide Act of 1978, p. 190, 191.
- ²⁵(Greenwich, Connecticut: Fawcett Publications, 1962).
- ²⁶Ibid., p. 22.

²⁷Blodgett, pp. 214, 215.

²⁸John H. Perkins, "The Role of Historical Inquiry In Environmental Education," Journal of Environmental Education 8(Spring 1979): 55.

²⁹U.S., Congress, House, Subcommittee on Science Research and Technology of the Committee on Science and Technology, Technical Information for Congress, Report to the Subcommittee, Prepared by Congressional Research Service, Committee Print (Washington, D.C.: Government Printing Office, 1979), p. 464.

³⁰Blodgett, p. 216.

³¹President's Science Advisory Committee, Use of Pesticides, (Washington, D.C.: Government Printing Office, 1963), pp. 19-23.

³²Ibid., p. iii.

³³Blodgett, pp. 217-218.

³⁴U.S., Congress, Technical Information . . ., p. 470.

³⁵Ruth Mulvey Harmer, Unfit For Human Consumption, (Englewood Cliffs, New Jersey: Prentice-Hall, 1971), p. 251.

³⁶Blodgett, pp. 218-219.

³⁷Act of May 12, 1964, Statutes at Large 78, 190 (1964).

³⁸U.S., Congress, Federal Pesticide Act of 1978, p. 191; Blodgett, pp. 220-221.

³⁹Blodgett, pp. 225, 230.

⁴⁰President's Science Advisory Committee, Restoring The Quality of Our Environment, (Washington, D.C.: Government Printing Office, 1965), p. 18.

⁴¹U.S., Congress, Senate, Subcommittee on Reorganizations and International Organizations of the Committee on Government Operations, Interagency Environmental Hazards Coordination. Pesticides and Public Policy, S. Rept. 1379, 89th Cong., 2d sess., 1966.

⁴²The report is titled "Effects, Uses, Control and Research of Agricultural Pesticides," April 19, 1965. It was printed in U.S., Congress, House Committee on Appropriations, Department of Agriculture Appropriations for 1966. Hearings Before a Subcommittee. Part I. 89th Cong., 1st sess., 1966.

⁴³Jamie Whitten, That We May Live, (Princeton: Van Nostrand, 1966), p. 124.

⁴⁴Blodgett, pp. 223, 230-231.

⁴⁵U.S., Department of Health, Education and Welfare, Report of the Secretary's Commission on Pesticides and Their Relationship to Environmental Health, (Washington, D.C.: Government Printing Office, 1969).

⁴⁶Ibid., pp. 7-19.

⁴⁷U.S., Comptroller General, Need to Improve Regulatory Enforcement Procedures Involving Pesticides. Report to the Congress, (Washington, D.C.: Government Printing Office, 1968).

⁴⁸Ibid., p. 20.

⁴⁹U.S., Comptroller General, Need To Resolve Questions of Safety Involving Certain Registered Uses of Lindane Pesticide Pellets. Report to the Congress, (Washington, D.C.: Government Printing Office, 1969).

⁵⁰U.S., Congress, House, Intergovernmental Relations Subcommittee of the Committee on Government Operations, Deficiencies In Administration of Federal Insecticide, Fungicide, and Rodenticide Act. Hearings. 91st Cong., 1st sess., 1969.

⁵¹Blodgett, pp. 233-235.

⁵²U.S., Congress, House, Committee on Government Operations, Deficiencies In Administration of Federal Insecticide, Fungicide and Rodenticide Act, H. Rept. 637, 91st Cong., 1st sess., 1969.

⁵³Blodgett, p. 238.

⁵⁴Wilma R. McCarey, "Pesticide Regulation: Risk Assessment and Burden of Proof" The George Washington Law Review 45 (1977): 1069.

⁵⁵Louis M. Holscher, The Attitudes of Farmers Toward Pesticides As A Social Problem, (Ph.D. dissertation, Washington State University, 1975) (Ann Arbor, Michigan: Xerox University Microfilms, 1975).

⁵⁶Blodgett, pp. 239-243.

⁵⁷U.S., Congress, Senate, Subcommittee on Administrative Practice and Procedure of the Committee on the Judiciary, The Environmental Protection Agency and the Regulation of Pesticides, Committee Print, (Washington, D.C.: Government Printing Office, 1976), p. 5.

⁵⁸Mary Jane Large, "The Federal Environmental Pesticide Control Act of 1972: A Comprehensive Approach," Ecology Law Quarterly 3(1973): 289.

⁵⁹The case is summarized in Large, p. 289.

⁶⁰Act of May 12, 1964, Statutes at Large 78, sec. 3, 190 (1964).

⁶¹Large, pp. 290-291.

⁶²Ibid., p. 291.

⁶³Blodgett, p. 254.

⁶⁴E. Deck, "Federal and State Pesticide Regulation and Legislation," Annual Review of Entomology 20(1975): 125; Federal Environmental Pesticide Control Act of 1972, Statutes at Large 86, 973 (1972).

⁶⁵Federal Environmental Pesticide Control Act of 1972, Statutes at Large 86, sec. 12, 990 (1972).

- ⁶⁶Ibid., sec. 3, 979-982 (1972).
- ⁶⁷Ibid., sec. 2 (bb), 979 (1972).
- ⁶⁸Ibid., sec. 2 (e), 975-976, sec. 3 (d) 981-982, sec. 4, 983 (1972).
- ⁶⁹Ibid., sec. 2 (e), 975 (1972).
- ⁷⁰Ibid., sec. 4, 983 (1972).
- ⁷¹U.S., Congress, Senate, Subcommittee on Agricultural Research and General Legislation of the Committee on Agriculture and Forestry, Federal Environmental Pesticide Control Act. Hearings Before the Subcommittee. 92d Cong., 1st sess., 1971, p. 293.
- ⁷²Federal Environmental Pesticide Control Act of 1972, Statutes at Large 86, sec. 3 (c), 979-981 (1972).
- ⁷³Ibid., sec. 3 (c), 979-981, sec. 10, 989 (1972).
- ⁷⁴Ibid., sec. 10, 989 (1972).
- ⁷⁵Ibid., sec. 6, 984-987 (1972).
- ⁷⁶Ibid., sec. 6 (c), (e) 985-987 (1972).
- ⁷⁷Ibid., sec. 15, 993-994 (1972).
- ⁷⁸Ibid., secs. 21, 25, 27 (Note), 996-999 (1972).
- ⁷⁹Ibid., sec. 16, 994 (1972).
- ⁸⁰Ibid., sec. 8, 987-988 (1972).
- ⁸¹Ibid., sec. 9, 988-989, sec. 14, 992-993 (1972).
- ⁸²Ibid., sec. 14, 992-993 (1972).
- ⁸³Ibid., sec. 4, 983 (1972).
- ⁸⁴Ibid., sec. 24, 997 (1972).
- ⁸⁵Ibid., sec. 23, 996-997 (1972).
- ⁸⁶Deck, p. 119.

⁸⁷Federal Environmental Pesticide Control Act, Statutes at Large 86, sec. 20, 996 (1972).

⁸⁸Ibid., sec. 14, 992 (1972).

⁸⁹Ibid., sec. 3 (c) (5), 980-981 (1972).

⁹⁰U.S., Congress, Senate, Committee on Commerce, Federal Environmental Pesticide Control Act of 1972, S. Rept. 970 to Accompany H.R. 10729, 92d Cong., 2d sess., 1972, pp. 10-11.

⁹¹U.S., Congress, Senate Committee on Agriculture and Forestry, Protection of Man and the Environment, S. Rept. 838 (Part II) to Accompany H.R. 10729, 92d Cong., 2d sess., 1972.

⁹²According to John Quarles, an official of the EPA, national policy shifted emphatically from 1969 to 1972 toward greater efforts to control pollution because of political pressure from the public. John Quarles, Cleaning Up America, (Boston: Houghton Mifflin, 1976), p. 169.

⁹³Quarles sees 1973 as the year in which the public became significantly less environmentally oriented, a year in which the national consensus that had supported demands for environmental reform dissolved. Quarles, pp. 195, 201, 213.

⁹⁴U.S., Congress, House, Committee on Agriculture, Federal Environmental Pesticide Control Act. Review of FEPCA. 93d Cong., 1st sess., 1973.

⁹⁵U.S., Congress, House, Subcommittee on Forests of the Committee on Agriculture, Permit the Use of DDT, Hearings Before the Subcommittee. 93d Cong., 1st sess., 1974.

⁹⁶Ibid., pp. 2, 3; Robert van den Bosch, The Pesticide Conspiracy (Garden City, New York: Doubleday and Company Inc., 1978), pp. 84-85.

⁹⁷van den Bosch, pp. 86-87.

⁹⁸U.S., Congress, Senate, Subcommittee on Environment of the Committee on Commerce, Pesticide Oversight, Hearings Before the Subcommittee on Environment. 93d Cong., 2d sess., 1974.

⁹⁹Ibid., pp. 33-43; Luther J. Carter, "Controversy Over New Pesticide Regulations," Science 186 (December 6, 1974): 904.

¹⁰⁰Federal Insecticide, Fungicide, and Rodenticide Act, U.S. Code, vol. 7 sec. 136 b (1976); For an indication of the farmers' attitudes see the testimony of John Datt, Director of Congressional Relations, American Farm Bureau Federation in U.S., Congress, House, Committee on Agriculture, Federal Insecticide, Fungicide and Rodenticide Act Extension, Hearings. 94th Cong., 1st sess., 1975, pp. 250-254.

¹⁰¹For a description of the controversies over 2,4,5T, Strobane, and vinyl chloride see U.S., Congress, Pesticide Oversight . . ., pp. 100, 111, 143-144; for a description of the controversy over predator control see U.S., Congress, Federal . . . Review of FEPCA, pp. 12-21; for a description of the controversy over the hotline see "Congress: Don't Look for Much Help," Farm Chemicals, August 1975, p. 14.

¹⁰²An indication of industry criticism can be seen in Carter, p. 904.

¹⁰³U.S., Comptroller General, Environmental Protection Agency Efforts to Remove Hazardous Pesticides From Channels of Trade. Report to the Congress (Washington, D. C.: Government Printing Office, 1973), pp. 1-4.

¹⁰⁴U.S., Comptroller General, Pesticides: Actions Needed to Protect the Consumer From Defective Products Report to the Congress (Washington, D.C.: Government Printing Office, 1974), pp. 1-4.

¹⁰⁵U.S., Comptroller General, Questions on the Safety of the Pesticide Maleic Hydrazide Used on Potatoes and other Crops Have Not Been Answered (Washington, D.C.: Government Printing Office, 1974), pp. 11, 111.

106 See testimony of environmental groups in U.S., Congress, Pesticide Oversight . . ., and U.S., Congress, Federal . . . Extension. Hearings, 1975.

107 This is also the opinion of author William E. Reukauf. "Regulation of Agricultural Pesticides," Iowa Law Review 62 (1977): 918.

108 U.S., Congress, Senate. Subcommittee on the Environment of the Committee on Commerce, Federal Environmental Pesticides Control Act. Hearing. 94th Cong., 1st sess., 1975.

109 U.S., Congress, Federal . . . Extension. Hearings. 1975; U.S., Congress, Senate, Subcommittee on Agricultural Research and General Legislation of the Committee on Agriculture and Forestry, Extension of the Federal Insecticide, Fungicide and Rodenticide Act. Hearing on S. 1629, 94th Cong., 1st sess., 1975.

110 Federal Insecticide, Fungicide and Rodenticide Act, U.S. Code vol. 7 secs 136, 136a (d), 136b (1976).

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C H A P T E R I V
CONGRESS AND THE REGULATION OF PESTICIDES

Depoliticizing FIFRA

The last chapter has pointed out that the problem of pesticides was one of the basic issues on which the new environmental movement was based. Why is it no longer one of the more important environmental issues? Certainly of importance is the fact that some of the most harmful chemicals have been banned or severely restricted in the uses which are authorized. Furthermore, although public interest in the environment remains high, many would argue that it is not as extensive or intense as it was ten years ago. Of significant importance, however, was the passage of the 1972 revision of FIFRA. The pressures which began in 1962 with Rachel Carson's book and continued in the several reports and hearings and in a growing, strong, environmental movement had demanded a politically significant move on pesticides. This resulted in the 1972 legislation. The wording of the law and the EPA's early

banning of a few chemicals under its authority led many to conclude that the pesticide problem had been resolved. It was time to move on to other issues such as toxic substances control and hazardous waste regulation.

Meanwhile the House Agriculture Committee, a committee which one of its members has described to the writer as stacked with people who are pro-agriculture producers, maintained control over the authorization and oversight of FIFRA, a law which was now too environmentally oriented, as far as most of the committee was concerned, and which the EPA enforced too enthusiastically. The task for the Agriculture Committee was to do something about this situation without igniting the flame of public interest which had supported the passage of the 1972 FIFRA. An attempt to repeal FIFRA or transfer regulatory authority back to the USDA would have risked presenting the environmentalists with a clear issue which, the past had indicated, would probably have constituted a strong focal point for grass roots activity and which, therefore, would never pass Congress.

Thus the committee needed to weaken FIFRA without calling attention to the fact that it was being weakened. This chapter will argue that the committee has done this by attempting to depoliticize, as far as possible its

revision and oversight of FIFRA. Considering politics as conflict over the allocation of values, it will be argued that the committee has tried to remove the pesticides issue from the realm of conflict. It has gone about this in basically two ways:

1. By reducing the visibility of the changes made in FIFRA and
2. To the extent that it has not been able to reduce the visibility of change, by providing a fairly consistent set of explanations for its actions.

The visibility of change has been reduced by making many small changes in the law rather than a few large ones, by constructing many of these changes so that the law has been made needlessly complex, and by weakening the law by interfering with efforts to enforce it. The most important explanation the committee members have tended to provide centers on the concept of rationality. Changes in the law are rarely described as value choices, the implications of which will affect one group at the expense of another, they are "rational" procedures designed to increase the scientific quality of the regulatory process. These types of explanation tend to make

changes seem less political in nature and more neutral and thus they tend to remove the issue from conflict.

All this will be explained and criticized in the following pages, but first some background information will be provided. We will describe the primary participants in the legislative revision process. These include: the producers of pesticides, the primary users of the chemicals, the promoters of agriculture, the EPA, the USDA, the General Accounting Office, industries adversely affected by pesticides (such as fisheries or bee keeping) and the public interest groups. The relative influence of these groups will be explained. After this the role of public opinion will be described. Then we will examine the relative influence of the several congressional committees which deal with pesticides. This description will include an explanation of the attitudes of the House Agriculture Committee, the committee which exerts the most control over FIFRA. This committee exerts so much influence that most of this chapter will focus on it. When the committee being referred to is not specifically named, the reference is to the House Agriculture Committee.

The Participants

The producers and the users. The congressional politics of pesticides involves the interaction of a number of groups. First there are the pesticide manufacturers represented as individual companies, and in associations.

The most important association is the National Agricultural Chemicals Association (NACA), followed by the Chemical Specialties Manufacturers Association, the Pesticide Formulators Association, and the United Pesticide Formulators and Distributors Association. The manufacturers are very influential in the shaping of pesticide policy. They realize that some form of regulation is politically inevitable, but they support less stringent enforcement of FIFRA and revisions to the law which tend to weaken it.

Second are the several different types of users of pesticide products. The most important users are farmers, represented by such groups as the American Farm Bureau Federation and the National Grange, and many organizations devoted to the promotion of a single crop, such as the National Cotton Council of America and the Minnesota Soybean Growers Association. Then there are

groups which provide pest control services for farmers such as the National Agricultural Aviation Association. Also there are nursery users, forest product users, and florists, each represented by their own associations. Finally, the pest exterminating companies are represented by their association, the National Pest Control Association, and by individual companies such as Orkin Exterminating and Terminex International Inc.

The users have an interest in maintaining a wide variety of chemicals for pest control with as few restrictions on the applicator as possible. They are, for the most part, unconcerned about the potential adverse effects of pesticides, and therefore they almost always support the goals of the chemical companies. The attitudes of most users seem to coincide with that of farmers (by far the largest users). A survey of Yakima County, Washington farmers in 1975 indicated that farmers highly favor the use of pesticides in agriculture and are not concerned with the possible negative consequences of pesticide use.¹ The two variables most closely correlated with these attitudes were gross farm income and the source of total net income. As gross farm income increased, favorable attitudes increased,

while concern over negative consequences decreased. Those earning more of their net income outside farming favored the use of pesticides less than those whose major source of income was farming. Farmers earning the major percentage of their net income outside agriculture were found to be more concerned with the dangers of using pesticides.

Friends of the farmer. Next there are the promoters of agriculture. These groups tend to advocate less stringent regulation as a means of ensuring high agricultural productivity. They include: the USDA which almost always testifies at FIFRA hearings; various state departments of agriculture; the National Association of State Departments of Agriculture; the Association of American Pesticide Control Officials; individual experts from the Land-Grant Colleges, such as plant pathologists and entomologists; the American Registry of Professional Entomologists; the Entomological Society of America; the State Cooperative Extension Services; the buyers and processors of crops, such as the National Cannery Association; and at least two organizations, the Agricultural Research Institute (ARI) and the Council for Agricultural Science and Technology (CAST), which provide information on this

and other issues and which receive a substantial proportion of their support from industry.²

The pesticide manufacturers, the user groups, and the promoters of agriculture all generate pressure exerted toward more lenient regulation. They are so similar in their positions that for convenience when discussing the political forces influencing policy, the term "industry" will normally be used to refer to this complex of groups. This is more convenient than referring to a manufacturer-user group-promoter of agriculture complex. When referring only to the pesticide manufacturers a term other than "industry", such as producers or manufacturers, will be used if the meaning is not clear in the context.

Other participants. EPA officials testify at almost all FIFRA related hearings. Not infrequently a General Accounting Office spokesman outlines the results of an investigation. Occasionally there are representatives from an industry which is particularly vulnerable to the unwise use of pesticides, for example the producers of honey. These types of industries are not, however, frequent participants in the proceedings.

The public interest groups. Finally, there are the public interest groups. The most active public interest groups concerned with pesticide regulation on a national scale have been: the National Audobon Society, Friends of the Earth, the Natural Resources Defense Council, the Rachel Carson Council and the Environmental Defense Fund. Until recently the Environmental Defense Fund was probably the most active of these, but it has now shifted its attention to other environmental matters. Other groups which have dealt with the issue, but less consistently, include the Sierra Club, the National Wildlife Federation, Rural America and the Public Citizens Health Research Group. More stringent regulation is also advocated by groups representing farm laborers, such as the United Farm Workers and the Migrant Legal Action Program. There are also many state and local groups around the country which focus attention at those levels.

The chief strength of the public interest groups lies in public opinion. The chief weaknesses arise from lack of money and the consequent inability to hire people and mobilize resources in order to organize and disseminate political and technical information.

Resources, information and the quality of testimony. Environmental issues usually involve a great deal of technical information. Keeping up with this information is a full time occupation and a lack of money means that the environmental groups can hire fewer people to keep informed and present useful testimony.³ Environmentalists are spread so thin that sometimes they do not even testify at hearings or public meetings concerned with pesticide regulation. For example at the Senate Hearings on FIFRA in 1977, the National Wildlife Federation submitted its testimony by letter because time constraints prevented its representative from attending.⁴ At a public meeting held by an EPA panel in October 1980 to discuss rules for testing biorational pesticides, there was heavy participation by industry, but no questions or comments by members of environmental or public interest groups.⁵ Furthermore, when environmentalists do testify the quality of the testimony is often not as good as that of industry. It tends to be shorter and to miss important facets of the issue. For example in the House hearings on FIFRA held in April and June 1977, the EDF and National Audubon Society presented no position on "registrations for minor use" an important topic discussed at the hearings.⁶ In general there is no

comprehensive effort to thoroughly analyze each important topic discussed at the hearings.

All this does not seem to be the result of lack of effort. It is because there are too few environmentalists trying to do too much with too few resources. The lack of scientific resources is particularly evident. The industry has a strong scientific infrastructure. It supports many scientists who do research and it has many lobbyists who are skilled at transmitting the results of this research to Congress and describing research results in the most favorable light. The environmentalists are very limited in their ability to support research. Environmentally oriented research does go on in universities, foundations, and government agencies, but the environmentalists do not have the resources to thoroughly analyze this research and present the results to legislators and administrative decision-makers in a systematic, rigorous manner.⁷ While the industry often summons experts to support its point of view, it is a rare event when the environmentalists can present a scientist to testify. (This question of scientific input to FIFRA will be more extensively dealt with in a later chapter).

Having said all this, the quality of the environ-

mentalists testimony is surprisingly good when one considers the amount of people working on the issue, however it does not compare favorably to that of industry.

Although there are sometimes exceptions, the environmentalists generally have not had the initiative in pesticide policymaking. They have tended more to comment on the issues brought up by others rather than to set forth issues themselves. When they have tried to create issues, such as repeal of the indemnity provision of FIFRA, legislators tend to politely ignore them.

One reason that they are ignored is that they are greatly outnumbered. A description of those testifying or submitting correspondence which was included in the record of three House Agriculture Committee hearings (two in 1977, and one in 1980) provides a good summary of the alignment of forces.⁸ Advocating more environmentally oriented regulation were: seven environmental organizations, the National Fisheries Institute, Rural America, and the American Honey Producers Association. Advocating less stringent regulation were: seven associations of pesticide producers, twenty-one chemical companies, eight exterminating companies, fifteen associations of growers and marketers (such as the American Farm Bureau Federation and the National Cotton Council

of America), five groups representing other users of pesticides (such as the Society of American Florists and the National Pest Control Association), the National Cannery Association, the National Agricultural Aviation Association, the Experiment Station Committee on Organization and Policy, the Agricultural Research Institute, the Council for Agricultural Science and Technology, nine agricultural or pest control experts, four state officials, the State Cooperative Extension Service, a pest control advisors association, the Association of American Pesticide Control officials, the National Association of State Departments of Agriculture, and the American Registry of Professional Entomologists.

Given this arrangement of forces, and the higher quality of industry testimony, Agriculture Committee hearings on FIFRA are generally an industry dominated event. Industry representatives are confident, self-assured, well dressed and well informed. At the hearings which the writer attended most of the first two rows of seats were occupied by industry people, while the environmentalists sat further back. The environmentalists are almost always treated with courtesy by the legislators, but questions asked at the end of testimony are usually not as numerous as those asked of industry.

At times, there is an air of condescension as in the following exchange between Congressman Volkmer and Linda Billings of the Sierra Club. Volkmer was criticizing the pesticide applicator training program:

Volkmer: Ms. Billings I am very interested in this problem. We are trying to train people to do something they already know.
Do you have a degree?

Billings: Yes; I do.

Volkmer: What is that degree in?

Billings: Political Science.

Volkmer: Do you know how to add and subtract?

Billings: Yes.

Volkmer: If somebody came to you and said that you had to go to a course and sit and listen for three hours to know how to add and subtract for you to continue with your employment, would you think that is silly?

Billings: I would question whether we are comparing the right thing here.⁹

It is unlikely that an industry representative would ever be asked if he could add or subtract.

Public opinion. Public opinion on a national level concerning the particular issue of pesticides is difficult to assess. There are, however, several recent polls which indicate that the public is still interested in maintaining a clean environment. These polls define the environment in the broad sense and do not treat the issue of pesticides in particular. A 1981 New York Times/CBS News Poll of 1479 voting age Americans indicated that 67 percent of respondents wanted to maintain

present environmental laws even at a cost in economic growth.¹⁰ A recent Harris survey showed that 86 percent of those interviewed opposed making the Clean Air Act less strict.¹¹ A poll conducted in California, the state with the most stringent pesticide regulations in the country, did examine attitudes toward pesticides. It indicated that two-thirds of those questioned believed that the use of chemical pesticides by California growers presents a danger to their health. Of this two-thirds, four-fifths said they were willing to pay more for fruits and vegetables grown without pesticides.¹² If the feelings of Californians are an indication of the national attitude, and if the opinions expressed on the environment in general apply in particular to pesticides, then there is considerable public support for protection of the environment from the harmful effects of pesticides.

The problem occurs in translating generalized beliefs into support for specific policy proposals. The pesticide issue is an extremely complicated one, not only politically, but technically. For example balancing of the costs and benefits of a pesticide's use involves the consideration of the possible carcinogenicity of the substance and scientific debates

concerning what type of evidence is acceptable proof of carcinogenicity. It is also likely to involve complicated arguments concerning the relation of the chemical to productivity and the effect on the agricultural economy of its banning. The scientific debate on any controversial pesticide quickly becomes so complicated that it is difficult for even concerned segments of the public to know what their interests are. Constraints of time and the need for specialized knowledge prevent even the interested, well educated citizen from being entirely informed about all aspects of the issue. Thus public input is very indirect and generalized, taking the form of broadly defined and unspecific value preferences. It is a latent force which congressmen, administrators and industry groups try not to arouse while environmental groups try to mobilize it as much as possible. Given the demands of this complicated policy area, most pesticide policy is initiated by experts, experts in the scientific aspects of the problem and experts in the political and administrative aspects. These people devote very much of their time to the subject and consequently develop enough knowledge to deal with it competently.

Committees Involved In Pesticide Regulation

The agriculture committees. In the legislative revision of FIFRA there is little initiative from the Office of the President. The EPA does make some recommendations for changes in the law, but most of the initiative is with Congress.

The primary committees having legislative and oversight jurisdiction over FIFRA are the House and Senate Agriculture committees.¹³ Of these the House Committee takes considerably more interest in FIFRA and is more familiar with the problems associated with the law. For this reason this description will focus most on the House Committee; however the Senate Committee does pay a substantial amount of attention to pesticide regulation. While the Senate Committee is slightly more sympathetic to environmental concerns, both committees pay relatively little attention to the environmental problems associated with pesticides. They are primarily interested in ensuring that farmers have available to them as many pesticides as possible with as few restrictions as possible. In order to realize these goals they generally tend to support legislative revisions which weaken FIFRA. They also strongly oppose

the vigorous enforcement of the law. Very often when the EPA takes a strong enforcement action, the committees let their displeasure be known.

Interviews with several House Agriculture Committee congressmen and their staff and examination of the records of hearings and floor debates from 1972 to 1980 indicate several important attitudes which tend to be found among committee members. Most important, as has been said, they are interested in meeting the demands of their farm constituents for minimum regulation of pesticides. Farmers are interested primarily in having an unrestricted supply of as many different pesticides as possible available to them to meet their crop protection needs. When the EPA removes a pesticide from commerce because it is carcinogenic, farmers do not tend to look on this action as an attempt to protect their health. They see it as the removal of a product which they may need in the future to control a pest against which other chemicals are less effective. When the EPA began to enforce that section of FIFRA which required applicators of the more dangerous "restricted" pesticides to be competent in their use, the farmers reacted strongly to the Agency's proposal for testing to determine competence. They did not see testing as

a means of ensuring that they or their employees were not harmed by the misuse of pesticides, they saw it as government interference in their lives and another bureaucratic nuisance to be dealt with. These attitudes make farmers the allies of the pesticide manufacturers and the Agriculture Committees are quite sympathetic to both groups.

The EPA has been far from vigorous or efficient in its enforcement of FIFRA. On the other hand, it would be inaccurate to describe it as merely fulfilling a symbolic function. The Agency does, from time to time, make a strong enforcement move. This action has earned for it the strong opposition of the House Agriculture Committee. Members of the Committee see the EPA's enforcement of FIFRA as being arbitrary and capricious.

Most committee members do not seem to be as interested in FIFRA as in other pieces of legislation. The law is extremely complex and the public is not particularly aware of its existence. Many of those interviewed wanted to know why the author was interested in FIFRA. The attitude of most committee members can be seen in Congressman Findley's characterization of the law as, "one of the most thankless tasks in the House of Representatives."¹⁴

The House committee members and their staff do not seem to have much understanding of the concerns and theoretical assumptions which form the basis of the environmental movement. For example most of those interviewed could not mention one book on the environment that they had ever read. Environmentalists are seen as another interest group participating in the political process. There is very little understanding of the environmental perspective as a way of conceptualizing and approaching solutions to a number of technical pollution problems. There are a very few members who are exceptions to this generalization, Congressman George Brown of California being the most notable. Brown has often spoken out against the weakening of FIFRA.

The Committee is much more supportive of legislation which tends to weaken FIFRA than is the rest of the House. Research done in Congress from 1973 to 1978 indicates that a substantial level of political support for environmental legislation exists and that it has remained stable and not diminished in the face of economic problems and energy shortages.¹⁵ However most congressmen know very little about FIFRA and have little motivation to try to understand this complex legislation.

Thus, although environmentally oriented legislators do become involved in the politics of FIFRA, this law tends to be the object of comparatively less attention on their part. This lack of attention and the attitudes of the Agriculture Committee members have ensured that the changes to FIFRA from 1972 to 1980 have weakened the law. The Agriculture Committees have also made it difficult for the EPA to enforce the law. It has often been suggested that a primary reason for the weakness of FIFRA and the poor enforcement of it is that the Agriculture Committees, rather than committees primarily concerned with protection of public health or the environment, have primary jurisdiction.¹⁶

Other committees. There are several other committees in Congress which have an interest in pesticides and which occasionally hold hearings and issue reports on pesticide regulation. These committees provide a counter-weight to the Agriculture Committees but this weight is not sufficient to even approach a balance in influence. Their interest is often enthusiastic but it is not consistent and hearings are held irregularly.

As already mentioned, the Subcommittee on the

Environment of the Senate Committee on Commerce provided a considerable environmentally oriented influence in framing the 1972 FIFRA. The Subcommittee contributed an opposing viewpoint to the farmer oriented Agriculture Committee. The Environment Subcommittee continued its interest in FIFRA until 1975, holding hearings in 1974¹⁷ and 1975. It held no hearings after 1975.

The gap in the environmental lines left by the Subcommittee on the Environment was somewhat filled, though to a lesser degree, by Senator Edward Kennedy's Subcommittee on Administrative Practice and Procedure of the Committee on the Judiciary. The Subcommittee's hearings in 1976 on the testing of pesticides and other chemicals led to the establishment of the EPA's laboratory audit system.¹⁸ The staff report produced in 1976 led to substantial changes in registration procedures which were aimed at ensuring that the public was protected.¹⁹ In 1978 Senator Kennedy requested that the GAO study the EPA's pesticide program. The result was a study which criticized the EPA's management of the program.²⁰

Also worthy of mention is the Senate Subcommittee on Health of the Committee on Labor and Public Welfare which is also under Kennedy and which jointly sponsored

the just mentioned hearings on chemical testing with the Administrative Practice and Procedure Subcommittee. In remarks during the debate on the revision of FIFRA in 1977, Senator Kennedy announced that as Chairman of this subcommittee he would "continue our intensive inquiry into the EPA's effort to regulate pesticides."²¹ The inquiry has not been too intensive. Neither the Health or Administrative Practice and Procedure Subcommittee has held a hearing or made a significant policy move on pesticides since 1976.

On the House side there was no effective voice on pesticides except Agriculture until about 1976. Then the Subcommittee on Oversight and Investigation of the House Committee on Interstate and Foreign Commerce under Congressman John E. Moss of California, and later under Bob Echardt of Texas, began to take an interest. The committee claims jurisdiction because the Food, Drug and Cosmetic Act, which regulates pesticide residues in food, is under its jurisdiction. The committee has held two hearings which dealt with pesticides among other subjects and two hearings which dealt exclusively with pesticides.²²

The House Subcommittee on Conservation, Energy and Natural Resources of the Committee on Government

Operations held hearings on the EPA's implementation of FIFRA in 1976, however this was the only time that hearings were held by this subcommittee.²³

Again it is important to emphasize that these committees are not as active as the Agriculture Committees in conducting hearings or on the floor of the legislative bodies. Furthermore, their hearings and reports are generally not followed by concrete legislative proposals aimed at substantially strengthening FIFRA, and their members usually do not offer substantial opposition in floor debates to amendments which would weaken FIFRA. An exception is the strong opposition offered by Representative Moss, Chairman of the Oversight and Investigation Subcommittee, in the House debate in 1977 over proposed changes to FIFRA. Moss objected strongly to the proposed provision allowing for conditional registration.²⁴ This provision allowed for the registration of a pesticide even if all of the safety testing data normally required for testing was not accumulated. Thus a manufacturer who had done a substantial amount of testing of his product, but who had not completed all tests could be allowed to "conditionally" register the product and sell it in commerce.

Moss objected that this might allow the exposure of the public to a dangerous pesticide, the harmful aspects of which had not yet been indicated by testing. His strongest objection was that his subcommittee had carefully examined the concept of conditional registration and determined that its enactment would interfere with his subcommittee's ability to protect the public from harmful pesticide residues.

Mr. Moss felt so strongly about conditional registration that he included in the Congressional Record a letter he had written to the Chairman of the House Agriculture Committee so that the public could know, "what information the Agriculture Committee had in hand when it reported the bill."²⁵ The information which the Agriculture Committee had was the opinion of two high EPA officials who questioned the wisdom of conditional registration. One of the officials, Edwin L. Johnson, the Deputy Assistant Administrator For Pesticide Programs, was quoted as saying that under conditional registration the Administrator would not be able to make the determination required by FIFRA that a pesticide would perform its function without any unreasonable adverse effects on the environment. Congressman Moss lost his battle over conditional registration. As usually happens in

both the House and Senate, the legislators accepted the Agriculture Committee recommendations.

The Appropriations Subcommittees also cover the subject of pesticides, but usually they do so in the context of looking at the entire EPA budget. There is not time to look carefully at the subject and so the questions asked in hearings tend to cover only a few aspects of pesticide regulation. The relevant subcommittees are the House Subcommittee on HUD-Independent Agencies and the Senate counterpart of the same name. Before 1975 jurisdiction was under the House and Senate Subcommittees on Agricultural and Environmental and Consumer Protection Appropriations. Under Congressman Jamie L. Whitten of Mississippi the House Subcommittee on Agricultural and Environmental and Consumer Protection paid a little more attention to pesticides than the Appropriations Subcommittees have normally tended to do. Congressman Whitten has written a book which can be described as a pro-pesticide answer to Rachel Carson's Silent Spring.²⁶ The book emphasizes the advantages of pesticides and disputes much of the evidence concerning their harmful effects. Mr. Whitten's committee staff has written reports on the subject and he has taken the opportunity of hearings to criticize such EPA

decisions as the restriction of DDT.²⁷ Nevertheless even Mr. Whitten has not dealt with the subject in nearly as thorough and consistent a manner as the legislative committees. The appropriations hearings do not provide a forum conducive to a substantial examination of the topic.

Congress: Weakening the Law

Since 1972 Congress has tended to impede the strict regulation of pesticides in two ways:

1. By weakening the law.
2. By interfering with the EPA's efforts to enforce the law.

The shortcomings of the 1972 law have been discussed, but this legislation did provide the basis for some protection of the environment and it was substantially stronger than what remained of FIFRA in 1980 after three revisions. Shortly after passing the 1972 legislation, many Agriculture Committee members realized that they had approved what was (from their point of view) an excessively strong law which was being enforced by what they saw as an excessively pro-environmental EPA. They responded to this realization by weakening the law

and by interfering with the EPA's attempts to enforce it. As the previous description of Senator Kennedy's and other committees' work indicates there has been representation for the environmental point of view, but the greater influence of the Agriculture committees has led to the resolution of congressional conflict in the direction noted.

In the last chapter the specific provisions which tended to weaken the law were discussed. We will here describe first the meaning of these provisions as ways of directly weakening FIFRA and then the way in which the Congress has indirectly weakened the law, that is by interfering with the EPA's enforcement efforts.

Congress has gone about the business of directly weakening FIFRA by making many small changes, rather than substantial revisions, and by increasing the complexity of the legislation. In order to justify these actions, the legislators have provided a fairly consistent set of explanations. We will deal first with the explanations describing what they are and critically analyzing them. We will then describe the process of change.

Explanations. The most consistently offered reasons for legislative revisions tending to weaken the law have been:

1. That the law and the EPA's administration of it have failed to adequately consider the needs of agriculture and the economy.
2. That the proposed revisions are attempts to increase the rationality and scientific content of the process.

The Agriculture Committee hearings on FIFRA are full of references made by congressmen to the effects of FIFRA and the Agency's implementation of this law on agriculture and the economy. The harmful effects of unrestricted use of pesticides are rarely mentioned. An example of the attitudes expressed by many members can be seen in Congressman Steven Symms's statement to Deputy Administrator John Quarles during hearings on FIFRA in 1975:

It seems as if you think nothing of imposing restrictions on the private sector of the economy. The Government moves merrily down the road with no concern about what happens to the consumers, the housing market and to all the other consequences. The Government makes some capricious rulings.²⁸

The dominant way of looking at this problem is through the perspective of risk-benefit analysis, a

concept which is an integral part of the language of pesticide regulation. Legislators echo the demands of farmers and producers that the risks of pesticide use must be weighed against the benefits, among the most important of which are the increased yields which, they argue, are attributable to pesticide use. Risk-benefit analyses are often referred to. Many of these analyses tend to stress the effects which the banning of a pesticide would have on the agricultural economy. They are based on agricultural science and economics and are thus a form of the dominant terms used in the discussion of pesticides - "rationality" and "science."

In justifying their weakening amendments, many congressmen claim that the EPA fails to make adequate use of science in making its pest control decisions. A new procedure required by a legislative change will increase the rationality of the decision making process by providing an opportunity for more scientific input. The record of the hearings of the Agriculture committees is filled with references to the need for more scientific input into the pesticide regulation process.

Thus in discussing FIFRA legislators make frequent references to two closely related concepts - "rationality" and "science." These concepts are rarely if ever

specifically defined. They are used most often in a context which indicates that they refer to the most efficient means of producing effective regulation, but the explicit meanings of the terms are almost never described. One group's view of what constitutes effective regulation may be quite different from that of another group. Thus legislators who use the term "rationality" in referring to a proposed amendment may be speaking about something quite different from what others might consider rational. For example Congressman William Wampler sponsored a provision in the 1980 revision of FIFRA which provided for scientific peer review of EPA suspensions of pesticide registrations.²⁹ In supporting his proposal Wampler claimed that he was addressing the necessity for careful review of the scientific basis for the Agency's decisions.³⁰ He claimed this even though the EPA official most responsible for pesticides, Mr. Jellinek, had opposed the amendment because he felt that it was unnecessary, redundant, and would add, " . . . another provision for reviewing Agency decisions on top of a whole series of review provisions that already exist and that we have discussed at some length."³¹

Often even if we interpret the term "rationality" in a very broad sense, the ways in which the legislators

use this term seem quite inconsistent with their actions. For example the desire of Congressman Wampler and his Agriculture Committee colleagues for rationality in decision making and maximum scientific input does not square well with their support of an amendment to FIFRA to allow the use of the pesticide, Mirex. This chemical was introduced in 1960 and applied throughout the South to control the fire ant.³² In 1969 an HEW Commission recommended termination of the use of Mirex on the basis of a positive cancer test conducted by the National Cancer Institute. In 1978, a second National Cancer Institute study confirmed the carcinogenic potential of this chemical. Mirex persists in the environment for dozens of years. It tends to accumulate in food chains and it is present in the tissue of approximately one in every five persons in the states where it was heavily used.

The EPA has an elaborate hearing procedure which it must follow in cancelling a pesticide. This procedure allows for maximum input of information, especially scientific information, about the risks of the substance in question to human health or the environment and its benefits in controlling pests. The EPA hearing process for Mirex was lengthy and thorough and resulted in a

decision to cooperate with its manufacturer in phasing
33
out its use.

On May 3, 1979 by a vote of 22-11 the full Agriculture committee adopted an amendment which allowed the use of Mirex with certain restrictions in the years 1979 and 1980. This was done without even considering this issue in the committee hearings which had just been held. The committee thus voted to bypass the scientific and economic expertise of the EPA and to make a decision which it normally delegated to those with technical expertise. The vote of 22-11 was hardly close, but there were some members who objected that disregarding the normal procedures was unjustifiable and could set a dangerous precedent. The significance of this vote was summarized in a letter from Administrator Costle to Committee Chairman Foley protesting the amendment:

One of the concerns expressed time and time again by the members at this year's FIFRA oversight hearings was the need for sound scientific bases for our decisions and the desirability of consulting with the Scientific Advisory Panel and other outside scientists prior to taking regulatory action. Yet the full committee voted to reintroduce Mirex across the South without hearing even five minutes of testimony from scientists about the risks and benefits of that chemical. By contrast the three year hearing conducted by EPA prior to the cancellation of Mirex took over 12,000 pages of testimony from experts in economics, agriculture, entomology and the many scientific disciplines which contribute to risk

assessment. The Committee's action is a disturbing precedent and suggests that pesticide regulation may now be governed by other than scientific factors. Having established a process by law under which sound technical evaluation is made of each use of each pesticide, we do not believe Congress should begin to legislate either the approval or disapproval of pesticides.³⁴

The Mirex amendment was defeated on the House floor, most probably because it was a change from the normal tactic of weakening FIFRA through many small changes. This would have been a big change and a substantial precedent. Its discussion brought the normally quiet issue of pesticides to the public's attention. The Washington Star printed an editorial which described the proposal as unworthy of Congress and verging on irresponsibility.³⁵ The debate on Mirex was lengthy and those opposing the measure included such environmentally oriented legislators as Andrew Maguire, Henry A. Waxman, and George Brown.³⁶ Thus the Committee had gone a little too far, but although the measure was defeated in the full House, the Committee's vote on Mirex provided a strong example of its attitude concerning scientific input and the need to make FIFRA more "rational."

Another indication of the Committee's commitment to rationality is its almost complete inattention to the series of GAO reports and reports produced by other

committees. Most of these reports, which were summarized in the previous chapter, have shown how pesticide regulation was less than adequate to protect public health. In its revisions of FIFRA, the Committee addressed very few of the issues raised in these reports. Furthermore, the reports were rarely even discussed in the Committee's hearings.

It appears that what most Agriculture committee members consider to be rational pesticide regulation is that which is more or less consistent with the interests of the manufacturers and pesticide user groups. By avoiding discussion of what is meant by rational regulation, the decision makers avoid the need to make explicit the value choices which their actions are tending to support. A careful analysis of who is winning and who is losing is replaced by appeals to "rationality" and "science," two symbols which are probably more dear to many than "Mom" and "Apple Pie." The replacement of value choices with symbols with high appeal tends to reduce the level of conflict.

The legislators often say that science should be used in order to make decisions more reasonable, but the question, "What is reasonable?" is rarely asked. Used in this way rationality is a means to an end which

is rarely discussed. Because the goals of rational procedures are rarely discussed, the procedures tend to become symbolic activities which provide the appearance of responsible decision making while actually making it more difficult for the EPA to responsibly administer FIFRA. Many of the FIFRA procedural requirements added by Congress have the effect of making the law more complicated, but not necessarily a more effective means of protecting public health or the environment. This has been pointed out by both EPA officials and congressmen.³⁷ Instead of taking an explicit stand concerning which interests should gain or lose in the continuing struggle over pesticide regulation, Congress obscures its value choices behind a facade of supposedly neutral, rational procedures which, by slowing down the pesticide regulatory process, have the effect of advancing the interests and supporting the values of the pesticide industry.

Many small changes. Because public attitudes concerning the environment have tended to remain positive, it has not been politically possible to weaken FIFRA in one dramatic move such as a complete revision of the law or a transfer of enforcement authority to the generally

pro-pesticide USDA. Such a move would constitute a clear and observable political value choice. It would provide a clear challenge to the environmentalists and it would give them a dramatic means of rallying grass roots support. The projected damage to the environment from an obviously substantial weakening of the law would be a rallying point as it was in the case of Mirex. Thus the means of weakening FIFRA can not be too overt. It must be through discouraging stringent enforcement by the EPA and through many small changes in the law which give the appearance of more fairly balancing risks and benefits and increasing the rationality of the decision making process. Some of these changes, such as conditional registration, have the effect of weakening the law directly.³⁸ Others, such as the requirement to consult the Secretary of Agriculture and the requirement for peer review, make the law less effective by making it more complex and thus adding to the administrative burden of the EPA in dealing with an already complex law.³⁹

A requirement that the Administrator must consult with the Secretary of Agriculture before making a cancellation decision is not likely to provide the basis of a substantial environmental lobbying and letter writing

campaign. However this requirement constitutes a considerable administrative burden when considered in combination with other changes made to the law from 1975 to 1980. These include: the requirement for peer review;⁴⁰ the requirement for the Administrator to publish in the Federal Register an analysis of the effect of a pesticide cancellation decision on the agricultural economy;⁴¹ the requirement that the Administrator consult with the Secretary of Agriculture before issuing proposed or final regulations;⁴² the requirement that if the Secretary comments on proposed or final regulations, the Administrator must comment on the Secretary's reply and publish this in the Federal Register;⁴³ the requirement for the Administrator to analyze the effects of regulations on the agricultural economy;⁴⁴ the requirement that all rules and regulations be referred to Congress for review;⁴⁵ the requirement for the EPA to set up a Science Advisory Panel;⁴⁶ the requirement for the Agency to establish rules regarding conflict of interest for the Panel members, and to submit cancellation and classification decisions and proposed and final rule changes to the Panel for comment;⁴⁷ the requirement that the Administrator solicit from the Science Advisory Panel comments and recommendations for

operating guidelines aimed at improving the quality of the scientific analyses made by EPA personnel which lead to decisions made by the Administrator;⁴⁸ the requirement that the Administrator respond to these comments and evaluations and publish this response in the Federal Register;⁴⁹ the requirement that the Administrator coordinate with the Secretary of Agriculture in identifying pests that must be brought under control;⁵⁰ and the requirement that the EPA perform several studies.⁵¹

These complicating changes have been described in detail in the previous chapter. If each one is considered alone or even if three or four are considered together they seem to be changes about which environmentalists should be concerned, but not alarmed. However if they are all considered together they comprise a substantial weakening of the law. They are an extra administrative burden added to a law which the last chapter has shown to be extremely complicated. In dealing with the subject of pesticides a substantial amount of legislative and administrative complexity is probably necessary; however FIFRA was already a quite complicated law before Congress started adding new requirements to it in 1975, and the EPA had already set

up some quite complicated procedures in order to administer the law. The new requirements put an extra burden on an EPA which was already understaffed.⁵²

When asked in 1979 why the EPA had not removed more potentially dangerous pesticides from commerce, EPA Assistant Administrator for Toxic Substances Steven Jellinek replied that:

Congress has added more and more procedural requirements to the cancellation process that call for additional layers of agricultural and scientific review and economic impact analyses.⁵³

These changes in the law which increase its complexity are supplemented by many small changes such as conditional registration, no testing for certified applicators, and assignment of primary enforcement responsibility to the states.⁵⁴ These changes weaken the law but do not necessarily make it more complex. When considered with the other changes which weaken the law by making it complex, their total effect is to make FIFRA a substantially less effective piece of legislation.

Congressional interference with enforcement. We come now to the subject of congressional interference with the EPA's administration of FIFRA. Before proceeding we should discuss the type of "interference" which is being

criticized. The perspective underlying this dissertation maintains that "interference" is quite appropriate if its aim is to eliminate inefficiency or corruption or to encourage an agency to enforce a law which it has neglected. What seems less than acceptable is congressional interference with Agency attempts to enforce the law as it is written. Citizens who might be concerned about whether or not the government is protecting them against the dangers of pesticides can be referred to the several pages in the U.S. Code which constitute FIFRA. The legislators can alleviate concern by pointing to FIFRA as a sound law which will provide substantial protection of human health and the environment. The weaknesses of this law have been extensively discussed, but it has also been pointed out that the law, as written, does provide some environmental protection. Without enforcement, however, the law is only several pages in the Code. It attains a reality as an operative means of protecting the public only in its enforcement. By making it difficult for the EPA to enforce the law Congress has weakened its substance. Each effort to interfere with enforcement makes the law less a real, meaningful instrument of protection and more a few pages to which the legislators can point as an indication that

all is well. Interference is a less visible means of weakening FIFRA than the repeal of specific provisions. Efforts at interference might take the form of criticism in the hearings or a phone call to the Administrator. These are less likely to be seen by reporters and thus be described in the press.

Congress tends to interfere with the EPA's enforcement efforts in two ways:

1. By reacting strongly to enforcement actions or steps which would make enforcement more efficient.
2. By attempting to pressure the Agency into making the types of risk-benefit decisions which favor the interests of farmers and pesticide manufacturers.

The second of these is the most common. Most decisions which the EPA makes on the cancellation or use of pesticides involve a balancing of the risks and benefits of the pesticide in question. The law delegates the authority to make these risk-benefit decisions to the Agency because it has the scientific resources and expertise necessary to do this. The legislators often, however, apply heavy pressure on the Agency to make the right decisions. Usually the "right" decisions are

those which favor the interests of the pesticide manufacturers and farmers rather than the environmentalists.

The legislators are able to interfere because of the constant possibility that they could pass legislation which would weaken FIFRA. Normally money is authorized for only about 12 months.⁵⁵ The short periods of authorization and relatively frequent hearings associated with reauthorization fortify congressional control.

Just as when changing the structure of the law, the legislators never go too far when interfering with its enforcement. No regulation of pesticides at all might lead to a substantial public reaction and result in demands for stronger legislation.

DDT and the tussock moth. Two examples illustrate the just described pattern of congressional interference: the first concerns a risk-benefit decision, the control of the tussock moth in the Northwest part of the country; the second involves the establishment of a "hotline" by the EPA in an attempt to make enforcement more efficient.

The tussock moth is native to Western forests. Its larvae feed on the needles of Douglas firs and true firs sometimes stripping and killing them.⁵⁶ Many trees,

however, survive their attack. Outbreaks of this pest periodically occur in Western forests and in the early 1970's one such outbreak occurred in Washington and Oregon. In order to control the moth many, including the logging industry, logging industry workers, U.S. Forest Service administrators, and local politicians, advocated the use of DDT. Others, including environmental groups and many forest entomology researchers, opposed this use.

Most uses of DDT had been banned by the Administrator of the EPA in 1972. However section 18 of FIFRA permits the Administrator to exempt any Federal or state agency from any provision of the Act if he determines that emergency conditions exist which require such an exemption.⁵⁷ In March 1973 the Forest Service and the states of Washington and Oregon filed requests with the EPA for the selective emergency use of DDT to control the moth. After considering the risks and benefits of the proposed action, the EPA decided in April to disapprove the requests. This decision precipitated extensive and vigorous political opposition. It was now too late to spray during the 1973 season, but political efforts focused on coercing the Agency into permitting spraying during the 1974 season. The fact

that DDT was also useful in controlling the gypsy moth, which is found in Eastern forests, also helped to generate opposition.

In House Agriculture Committee hearings in 1973 which were held to review the progress of the EPA in implementing the 1972 FIFRA, the EPA's decision on DDT was strongly criticized by Representative George A. Goodling whose attitude was shared by many Committee members.

Mr. Goodling. Just before I came here, this was placed on my desk, the U.S. Department of Agriculture Daily News Sheet Forest Service. "Forest Service, U.S. Department of Agriculture denied use of DDT for its control of tussock moth in Oregon and Washington today. Focuses its attention on other control possibilities."

Can you give us a reason why this request was denied?

Mr. Dominick (of the EPA). I certainly can Mr. Goodling.

Mr. Goodling. I want the real reasons, not emotional reasons. Most of your darn reasons are emotional, I am sorry to say, rather than scientific. But go ahead and give me your reasons for this.

Mr. Dominick. Well that is your opinion, Mr. Goodling.

Mr. Goodling. I am sticking to my opinion too. ⁵⁸

This was the tone of the many criticisms of the Agency being made at this time.

Later there was made the usual appeal to science.

Mr. Goodling. When your ruling came into being, you did not take the scientific avenue on DDT, you took the emotional angle, and you and I know it, and the world knows it. You listened to the environmentalists but refused to listen to scientists.⁵⁹

In October 1973 the Subcommittee on Forests of the House Committee on Agriculture held hearings on a bill which would have directed the EPA Administrator to approve registration applications filed by the USDA for the use of DDT on forests and other agricultural lands if, in the opinion of the Secretary of Agriculture, this chemical was required for the control of and protection against insect infestations.⁶⁰ This bill was aimed at permitting the use of DDT to control the tussock moth and the gypsy moth.⁶¹ At the hearings the EPA was again heavily criticized.⁶²

The bill discussed at these hearings was not the only one introduced. From July 18th to October 11, 1973, at least eight bills dealing with the EPA's regulation of DDT were introduced in Congress.⁶³ Also there were threats to introduce legislation which would have returned the regulation and registration of pesticides to the USDA.⁶⁴

There was also pressure applied from sources other than Congress. The Secretary of Agriculture promised

to use his influence to make DDT available for 1974 and the Secretary of the Interior stated his intention to try to obtain permission to use the chemical on Indian lands which his Department oversees.⁶⁵ Also the Pacific Legal Foundation filed suits in Federal District Court in November 1973 in an attempt to force the Agency to allow the use of DDT. (The Foundation is a non-profit legal foundation which is opposed to those who, in its view, use environmental considerations, under the guise of protecting the environment, to stop needed social and economic activities.)

In January 1974 the Forest Service and the states of Washington and Oregon again asked for permission to use DDT. Under intense political pressure, the EPA gave in and approved the emergency exemption request the next month. The results were the expenditure of at least three million dollars in spraying DDT (at a time when the moth population was suffering a natural collapse) and significant damage to the environment.⁶⁶

The pesticide hotline. In May 1975 the EPA established a toll free "Pesticide Hotline" telephone number so that those wishing to report a violation of FIFRA, such as the misuse of a pesticide, could call the Agency.

It was felt that this might be a particularly useful means of communication for migrant farmworkers who might wish to complain about an illegal use of pesticides which resulted in damage to their health. Many of these workers are illiterate and not familiar with the procedures necessary to make complaints.⁶⁷ The number was also intended to be a source of data on the scope of misuse. Furthermore it was intended to be a means of providing the public with free safety information concerning the use of pesticides.⁶⁸

The House Agriculture Committee found out about the existence of the hotline during the 1975 hearings on the proposed revision of FIFRA. The reaction was vigorous and emotional. Representative Steven Symms referred to the "Gestapo-like tactics" of the EPA.⁶⁹ Some members threatened to completely cut off funding for FIFRA.⁷⁰ The hotline was described as an "informant system," a "civil rights" issue, and as smacking of "vigilantism."⁷¹ It was alleged that advertising the project tended to " . . . stir up complaints and encourage Americans to tattle on their neighbors rather than provide information."⁷² In short, the hotline became a rallying point for criticisms of the EPA.

This was the attitude of the majority of the committee but a small minority defended the innovation. Congressman George Brown said that police departments have often found that only by citizen participation in reporting violations of the law, can the law be adequately enforced.⁷³ Congressman Matthew McHugh noted that elimination of the hotline would remove the only means available for migrant workers to communicate with the Agency.⁷⁴

The hotline was to be administered by a non-governmental group, the National Farmworker Information Clearinghouse. In radio advertisements announcing the telephone number the Agency included some unsubstantiated statistics on the numbers of farmworkers made ill and killed by pesticides. In response to congressional criticism, the Agency repudiated the unsubstantiated statistics and took over the administration of the hotline from the private group.⁷⁵ It continued, however, to operate the hotline in the face of persistent congressional criticism. In its defense, the Agency cited legal precedents and pointed out that other agencies including the Consumer Product Safety Commission, the Bureau of Mines, the Internal Revenue Service and the Drug Enforcement Administration, use telephone reporting systems

to obtain information about violations.⁷⁶ The criticism, however, continued.

At the same time that the committee was criticizing the hotline it was examining the proposed 1975 revisions to FIFRA. The proposal which would have weakened the law the most was the granting of veto power to the Secretary of Agriculture. To quickly review this proposal, it would have given the Secretary of Agriculture the authority to veto EPA cancellations or suspensions of pesticide registrations and any regulations made by the Administrator under the authority given to him by FIFRA. This would have meant that the authority of the Administrator to regulate pesticides would have been significantly undermined. He would have been prevented from taking any significant regulatory action without the consent of the Secretary. The regulation of pesticides had been transferred to the EPA from the Agriculture Department because of Agriculture's poor record of enforcement and generally uncritical acceptance of pesticides. Thus the granting of veto power to the Agriculture Secretary would have meant a substantial weakening of FIFRA. This proposal was, at the time, being seriously considered by the committee and the

lengthy EPA arguments against it indicate that the possibility of its becoming law was taken quite seriously by the Agency.

On July 18, 1975 in a letter to the Chairman of the Committee, EPA Deputy Administrator John Quarles said that he saw a tremendous need for communication with those affected by FIFRA, and that the hotline was a desirable means of maintaining this communication. For this reason the hotline would be continued.⁷⁷

Eleven days later, on July 29, 1975, EPA Administrator Russell Train appeared before the Committee. He concluded a lengthy statement in opposition to the proposed Secretary of Agriculture veto by announcing that in order to not allow a

. . . fairly minor matter to continue to exacerbate relationships between the Agency and the committee and the communications between us when we have a lot more important things to discuss and deal with, I will tell you here today that we are eliminating the whole hotline for any purpose whatsoever.⁷⁸

Evidently Train felt that it was necessary to offer this concession to the Committee in order to respond to the criticism and to avoid the substantial weakening of FIFRA which the Agriculture Secretary's veto would have provided.

In dealing with FIFRA, congressmen confront many complicated questions. The law itself is extremely complicated and many of the scientific and technical questions related to its revision are quite complex. Often the legislators, who must also deal with many other legislative matters, find it a very difficult law to understand. The hotline was a simple matter that became known just at the time that the Agriculture Committees were struggling with the revision of FIFRA. The simple nature of this issue and the time at which it became known were probably favorable to the pesticide industry's interest in seeing FIFRA enforcement weakened. Bob Hamman of Ciba-Geigy, headed the Regulatory Committee of the National Agricultural Chemicals Association at the time. According to him:

The hotline couldn't have come at a more opportune time. The regulations on registration and classification are so complicated that it is difficult for members of Congress to understand. But they could understand the hotline79

The hotline indicates the Committee's attitude toward real enforcement of FIFRA. The existence of a publicized toll free number might have substantially enhanced the efficiency of the Agency's enforcement efforts, especially by increasing the opportunity for

poorly educated or illiterate workers to communicate with it. This effort to put teeth into the EPA's regulatory plans had to be stopped.

Criticizing the hotline on the basis of the fact that it would have strengthened the Agency's regulatory ability would, of course, have been politically impossible. Thus criticisms tended to portray it as "vigilantism," a "civil rights issue," "a constitutional issue," "encouraging Americans to 'tattle' on their neighbors." It is interesting that in an interview with the writer in 1981, six years later, a legislator still referred to the hotline as "tattling." These descriptions of the hotline seem quite different from commonly accepted descriptions of drug enforcement telephone numbers or cooperative community efforts to communicate with police departments in reporting crime. These seem most often to be praised as public spirited citizen involvement in maintaining the well being of the community. Congressman Brown in stating his support for the hotline pointed out the fundamental reason for objections to it.

The problem with this program is that a lot of people don't agree with the law and, hence, they don't like to have it reported when there are violations of it. Therefore, they raise all

sorts of questions about its constitutionality and so on.

On the surface, it seems to me there is no real problem there. It is really the question of whether people want this particular kind of law on the books.⁸⁰

The tussock moth and pesticide hotline issues are merely two examples of congressional pressure on the EPA aimed at a lenient interpretation of FIFRA. The frequent hearings on FIFRA are full of complaints and strong criticism of the Agency. Some of the most often mentioned issues have been the ban on DDT, the use of Mirex to control the fire ant, the use of the herbicide 2,4,5T,⁸¹ and the problem of predator control.

Summary. Congress has removed FIFRA from politics by reducing the visibility of changes made and by providing a consistent set of explanations for its actions. Visibility has been reduced by making small changes, many of which have made the law needlessly complex, and by pressuring the EPA to enforce the law in a more lenient manner. Explanations for these actions have emphasized the importance of "rationality" and "science." Examples of congressional action and inaction have been presented in order to argue that these terms are used more as symbols to justify actions which tend to favor the

interests of industry rather than as descriptions of commonly understood legislative goals.

The public interest groups face superior forces in their attempts to influence legislation and regulation. Not only are their resources inferior, but they face the difficult task of educating their primary sources of support, the public, about a very complicated issue which involves many scientific unknowns such as the relation of chemicals to the initiation of cancer. Also of importance is their failure to criticize more vigorously many of the weakening changes which have been made in the name of rationality and science and their failure to appreciate and more vigorously criticize the economic influence of the industry on the scientific input to pesticide regulation.

This question of scientific input has also been largely ignored by Congress. If the legislators really wanted to make pesticide regulation more rational and scientific (in the sense of regulation based on more accurate knowledge of the risks and benefits of pesticides to the public) they would examine the economic influence of the pesticide industry on: what types of research get done, how the results of research are interpreted, and the way in which the results of research are communi-

cated to the public and legislative decisionmakers.

These kinds of questions, which are more or less ignored by both environmentalists and the Congress, are fundamental to the legislative and regulatory processes. The kinds of scientific input to which decisionmakers are exposed have a large influence on the types of decisions which will be made.

The subjective character of much of the interpretation of scientific data, the conflicting scientific theories and their implications for legislation and regulation, and the economic influence of the industry in all this constitutes what is, in essence, a scientific political process, a political process underlying the political process, a less observable sphere of politics which directly affects the more easily observable sphere. The next three chapters will examine this subject.

NOTES TO CHAPTER IV

1

Louis M. Holscher, The Attitudes of Farmers Toward Pesticides As A Social Problem, Ph.D. dissertation. Washington State University (Ann Arbor, Michigan: Xerox University Microfilms, 1975).

2

U.S., Congress, House, Subcommittee on Department Investigations, Oversight and Research of the Committee on Agriculture, Extending and Amending FIFRA. Hearings. 95th Cong., 1st sess., 1977; Eliot Marshall, "Scientists Quit Antibiotics Panel at CAST," Science 203 (February 1979): 732-733.

3

John Quarles, "Fighting the Corporate Lobby," Environmental Action, December 7, 1974, p. 5.

4

U.S., Congress, Extending and Amending FIFRA. Hearings. 1977, p. 323.

5

"FIFRA Science Panel Hearty In Endorsement of Tier Testing," Pesticide & Toxic Chemical News, October 15, 1980, pp. 17-18.

6

U.S., Congress, Extending and Amending FIFRA. Hearings. 1977.

7

The environmentalists do make some effective efforts. For example representatives of the Rachel Carson Council often appear at EPA hearings on pesticides and make a scientific input which is impressive considering their resources. The point is that these types of efforts are not nearly as thorough or extensive as those of the industry.

8

U.S., Congress, Extending and Amending FIFRA. Hearings. 1977; U.S., Congress, House, Subcommittee on Department Investigations, Oversight and Research of the Committee on Agriculture, Extension of Federal Insecticide, Fungicide and Rodenticide Act. Hearings. 96th

Cong., 2d sess., 1980; U.S., Congress, House, Committee on Agriculture, Federal Insecticide, Fungicide, and Rodenticide Act. Hearings. 95th Cong., 1st sess., 1977.

⁹U.S., Congress, Federal Insecticide, Fungicide, and Rodenticide Act. Hearings. 1977, p. 191.

¹⁰Philip Shabecoff, "Poll Finds Strong Support For Environmental Code," New York Times, 4 October 1981, p. 30.

¹¹Phillip Shabecoff, "Reagan Delaying Proposals for Clean Air Act," New York Times, 28 July 1981, p. 1.

¹²"Poll Shows Californians Worried About Food Grown With Pesticides," NCAP News, Winter 1981, p. 21.

¹³On the Senate side the full committee never holds hearings on FIFRA. Senate hearings are held by the Subcommittee on Agricultural Research and General Legislation. The correct name for the full Senate committee is the Committee on Agriculture, Nutrition, and Forestry. On the House side the full committee does often hold hearings on FIFRA. When a subcommittee holds hearings it is usually the Subcommittee on Department Investigations, Oversight and Research.

¹⁴U.S., Congress, House, Congressman Findley speaking about the Federal Insecticide, Fungicide, and Rodenticide Act, 95th Cong., 1st sess., 22 September 1977, Congressional Record, p. H9830.

¹⁵Henry C. Kenski and Margaret C. Kenski, "Partisanship, Ideology and Constituency Differences on Environmental Issues In the U.S. House of Representatives: 1973-78." Policy Studies Journal, 9(Winter 1980): 325-335.

¹⁶For example see U.S., Congress, House, 96th Cong., 1st sess., 28 June 1979, Congressional Record, p. E3365.

¹⁷U.S., Congress, Senate, Subcommittee on Environment of the Committee on Commerce, Pesticide Oversight. Hearings. 93d Cong., 2d sess., 1974; U.S., Congress, Senate, Subcommittee on the Environment of the Committee on Commerce, Federal Environmental Pesticide Control Act. Hearing. 94th Cong., 1st sess., 1975.

¹⁸U.S., Congress, Senate, Subcommittee on Health of the Committee on Labor and Public Welfare. Preclinical and Clinical Testing by the Pharmaceutical Industry 1976, Part II and Part III. (2 volumes) 94th Cong., 2d sess., 1976.

¹⁹U.S., Congress, Senate, Subcommittee on Administrative Practice and Procedure of the Committee on the Judiciary, The Environmental Protection Agency and the Regulation of Pesticides, Committee Print, (Washington, D.C.: Government Printing Office, 1976).

²⁰U.S., Comptroller General, Delays and Unresolved Issues Plague New Pesticide Protection Programs (Washington, D.C.: Government Printing Office, 1980).

²¹U.S., Congress, Senate, Senator Kennedy speaking on the Extension of the Federal Insecticide, Fungicide, and Rodenticide Act, 95th Cong., 1st sess., 29 July 1977, Congressional Record, p. S13098.

²²U.S., Congress, House, Subcommittee on Oversight and Investigations of the Committee on Interstate and Foreign Commerce, Regulatory Reform. Hearings. Volumes V and VI. 94th Cong., 2d sess., 1976; U.S., Congress, House, Subcommittee on Oversight and Investigations of the Committee on Interstate and Foreign Commerce, Environmental Causes of Cancer. Hearings. 94th Cong., 2d sess., 1976; U.S., Congress, House, Subcommittee on Oversight and Investigation of the Committee on Interstate and Foreign Commerce, Cancer-Causing Chemicals - Part 2: Chemical Contamination of Food. Hearings. 95th Cong., 2d sess., 1978; U.S., Congress, House, Subcommittee on Oversight and Investigation of the Committee on Interstate and Foreign Commerce, Involuntary Exposure to Agent Orange and Other Toxic Spraying. Hearings. 96th Cong., 1st sess., 1980.

²³U.S., Congress, House, Subcommittee on Conservation, Energy and Natural Resources of the Committee on Government Operations, EPA's Implementation of the Pesticides Control Act. Hearings. 94th Cong., 2d sess., 1976.

²⁴U.S., Congress, House, Remarks of Congressman Moss on the Proposed Amendments to the Federal Insecticide, Fungicide, and Rodenticide Act, 95th Cong., 1st sess., 31 October 1977, Congressional Record, pp. H11867-H11869.

²⁵U.S., Congress, House, Letter from Congressmen John E. Moss and Andrew Maguire to Congressman E. De la Garza, 95th Cong., 1st sess., 31 October 1977, Congressional Record, pp. H11867-H11868.

²⁶Jamie Whitten, That We May Live, (Princeton: Van Nostrand, 1966).

²⁷For an example of criticism see U.S., Congress, House, Subcommittee on Agriculture & Environmental & Consumer Protection Appropriations of the Committee on Appropriations, Agriculture, Environmental and Consumer Protection Appropriations For 1974, Part 5: Environmental Protection. 93d Cong., 1st sess., 1973, pp. 237-239, 474-477; For an example of a Report see Relationship of Pesticides to Environmental Issues, in U.S., Congress, House, Subcommittee on Agriculture & Environmental & Consumer Protection Appropriations of the Committee on Appropriations, Agriculture, Environmental and Consumer Protection Appropriations for 1974, Part 8. 93d Cong., 1st sess., 1973.

²⁸U.S., Congress, House, Committee on Agriculture, Federal Insecticide, Fungicide, and Rodenticide Act Extension. Hearings. 94th Cong., 1st sess., 1975; Other examples can be seen on pages 47, 128, and 145 of the just mentioned reference and in U.S., Congress, Federal Insecticide, Fungicide, and Rodenticide Act. Hearings. 1977, p. 184.

²⁹Federal Insecticide, Fungicide, and Rodenticide Act, U.S. Code, vol. 7, sec. 136w (e) (1980 Supp IV).

³⁰U.S., Congress, House, Remarks of Congressman William Wampler on the Federal Insecticide, Fungicide, and Rodenticide Act, 96th Cong., 2d sess., 17 June 1980, Congressional Record, p. H5067.

³¹U.S., Congress, House, Subcommittee on Department Investigations, Oversight and Research of the Committee on Agriculture, Extension of Federal Insecticide, Fungicide, and Rodenticide Act. Hearings. 96th Cong., 2d sess., 1980, p. 198.

³²This discussion of Mirex is based primarily on U.S., Congress, House, Committee on Agriculture, Extension of Federal Insecticide, Fungicide, and Rodenticide Act, H. Rept. 147 to Accompany H.R. 3546, 96th Cong., 1st sess., 1979.

³³U.S., Congress, Senate, Subcommittee on Agricultural Research and General Legislation of the Committee on Agriculture, Nutrition and Forestry, Extension of the Federal Insecticide, Fungicide, and Rodenticide Act. Hearings. 95th Cong., 1st sess., 1977, pp. 56-57.

³⁴U.S., Congress, Extension . . . House Report 147, 1979, pp. 17-18.

³⁵"Fire Ants and H.R. 3546," The Washington Star, 17 October 1979, as printed in U.S., Congress, House, 96th Cong., 1st sess., 26 November 1979, Congressional Record, p. 11147.

³⁶U.S., Congress, House, Debate on Mirex, 96th Cong., 1st sess., 26 November 1979, Congressional Record, pp. H1142-H1149; U.S., Congress, House, Debate on Mirex, 96th Cong., 1st sess., 28 November 1979, Congressional Record, pp. H11269-H11283.

³⁷As examples see the comment of Congressman Brown on the 1975 amendments to FIFRA in Chapter III and the just mentioned comment of Mr. Jellinek on Congressman Wampler's proposal.

³⁸Federal Insecticide, Fungicide, and Rodenticide Act, U.S. Code, vol. 7, sec. 136a (c) (7) (Supp IV, 1980).

³⁹Ibid., vol. 7, sec. 136d (b) (1976), vol. 7, sec. 136w (e) (Supp IV, 1980).

⁴⁰Ibid., vol. 7, sec. 136w (e) (Supp IV, 1980).

⁴¹Ibid., vol. 7, sec. 136d (b) (Supp IV, 1980).

⁴²Ibid., vol. 7, sec. 136w (a) (2) (B) (Supp IV, 1980).

⁴³Ibid., vol. 7, sec. 136w (a) (2) (B) (Supp IV, 1980).

⁴⁴ Ibid., vol. 7, sec. 136w (a) (2) (B) (Supp IV, 1980).

⁴⁵ Ibid., vol. 7, sec. 136w (a) (4) (Supp IV, 1980).

⁴⁶ Ibid., vol. 7, sec. 136w (d) (1976).

⁴⁷ Ibid., vol. 7, sec. 136w (d) (1976).

⁴⁸ Ibid., vol. 7, sec. 136w (d) (1976).

⁴⁹ Ibid., vol. 7, sec. 136w (d) (1976).

⁵⁰ Ibid., vol. 7, sec. 136w-3 (Supp IV, 1980).

⁵¹ Ibid., vol. 7, sec. 136w-4 (Notes) (Supp IV, 1980).

⁵² A high GAO official testified in February 1978 that the EPA needed more resources to do its job properly. U.S., Congress, Cancer-Causing Chemicals - Part 2 . . . Hearings. 1978, p. 24; However Agency attempts to get more money have been turned down by the OMB. U.S., Congress, The Environmental Protection Agency and the Regulation of Pesticides, Committee Print, 1976, p. 12; U.S., Congress, Senate, Subcommittee on Agriculture and Environmental & Consumer Protection Appropriations of the Committee on Appropriations, Agriculture, Environmental and Consumer Protection Appropriations for FY75, Part 2. Hearings. 93d Cong., 2d sess., 1974; U.S., Congress, The Environmental Protection Agency and the Regulation of Pesticides, Committee Print, 1976; The shortage of personnel at least partially explains the fact that although the law required that pesticides registered under the pre-1972 FIFRA be reregistered by 1976, the Agency failed to meet this deadline. Not only did it not meet this deadline, but by 1980 estimates of how long it would take ranged from ten to twenty years. One estimate by the GAO is up to fifteen years. U.S., Comptroller General, Delays and Unresolved Issues . . ., 1980, p. 4.

⁵³ Margot Hornblower, "Pesticide Spraying on Nearby Farmlands Sickens Their Families Housewives Say," Washington Post, 28 June 1979. As printed in U.S., Congress, 96th Cong., 1st sess., 28 June 1979, Congressional Record, pp. E3365-E3366.

⁵⁴Federal Insecticide, Fungicide, and Rodenticide Act, U.S. Code, vol. 7, secs. 136a (c) (7), 136b (a) (1), 136w-1 (Supp IV, 1980).

⁵⁵The 1972 FIFRA authorized funding until June 30, 1975. The 1975 revision authorized appropriations only for one year and four months after the enactment of the revision. The 1978 revision authorized appropriations for one year after the date of the revision. The 1980 revision authorized funding for only 9 1/2 months after it was enacted.

⁵⁶This description of the tussock moth DDT decision is substantially based on: Rudy R. Lachenmeier, "DDT and the Tussock Moth: The EPA in a Crisis Situation," Environmental Law 4 (Winter 1974): 135-184 and Robert van den Bosch, The Pesticide Conspiracy (Garden City, New York: Doubleday & Company Inc., 1978).

⁵⁷Federal Insecticide, Fungicide, and Rodenticide Act, U.S. Code, vol. 7, sec. 136p (1976).

⁵⁸U.S., Congress, House, Committee on Agriculture, Federal Environmental Pesticide Control Act. Review of FEPCA. 93d Cong., 1st sess., 1973.

⁵⁹Ibid., p. 17.

⁶⁰U.S., Congress, House, Subcommittee on Forests of the Committee on Agriculture, Permit the Use of DDT. Hearings. 93d Cong., 1st sess., 1974, p. 1.

⁶¹Ibid., p. 35.

⁶²Ibid., pp. 51-52, 55-62.

⁶³Lachenmeier, pp. 167-169.

⁶⁴Robert van den Bosch, "The Rape of EPA," Organic Gardening and Farming, 23 (January 1976): 94.

⁶⁵Lachenmeier, p. 169.

⁶⁶van den Bosch, pp. 86-87.

⁶⁷U.S., Congress, Federal Insecticide, Fungicide, and Rodenticide Act Extension. Hearings. 1975.

⁶⁸ Ibid., pp. 99, 100.

⁶⁹ "Congress: Don't Look For Much Help," Farm Chemicals, August 1975, p. 14.

⁷⁰ Ibid., p. 14.

⁷¹ U.S., Congress, House, Committee on Agriculture, Business Meetings on Federal Insecticide, Fungicide, and Rodenticide Act Extension. H.R. 6307, H.R. 8841, and S. 2375, 94th Cong., 1st sess., 1976, p. 81; U.S., Congress, House, Committee on Agriculture, Extension and Amendment of the Federal Insecticide, Fungicide, and Rodenticide Act As Amended, H. Rept. 497 to Accompany H.R. 8841, 94th Cong., 1st sess., 1975, p. 15.

⁷² U.S., Congress, Extension and Amendment of the Federal Insecticide, Fungicide, and Rodenticide Act As Amended, H. Rept. 497, 1975, p. 15.

⁷³ U.S., Congress, Business Meetings . . ., 1976, p. 86.

⁷⁴ Ibid., p. 149.

⁷⁵ "EPA's New Math Adds Up To Statistical Horror," Farm Chemicals, June 1975, pp. 33, 36; U.S., Congress, Extension and Amendment of the Federal Insecticide, Fungicide, and Rodenticide Act As Amended, H. Rept. 497, 1975, p. 15.

⁷⁶ U.S., Congress, Federal Insecticide, Fungicide, and Rodenticide Act Extension. Hearings. 1975, pp. 99-105.

⁷⁷ U.S., Congress, Extension and Amendment of the Federal Insecticide, Fungicide, and Rodenticide Act As Amended, H. Rept. 497, 1975, pp. 15-16.

⁷⁸ U.S., Congress, Business Meetings . . ., 1976, p. 86.

⁷⁹ "Congress: Don't Look For Much Help," p. 14.

⁸⁰ U.S., Congress, Business Meetings . . ., 1976, p. 86.

81 For an example related to DDT see U.S., Congress, House, Committee on Appropriations, Agriculture - Environmental and Consumer Protection Appropriation Bill, 1974, H. Rept. 275 to Accompany H.R. 8619, 93d Cong., 1st sess., 1973, pp. 11-13, 54, 111. For examples related to Mirex see U.S., Congress, Federal Insecticide, Fungicide, and Rodenticide Act Extension. Hearings. 1975, pp. 23, 24, and U.S., Congress, Business Meetings . . ., 1976, p. 92. For examples related to 2,4,5T see U.S., Congress, Extension of . . . Hearings. 1980, pp. 185-193, and U.S., Congress, House, Subcommittee on Department Investigations, Oversight and Research of the Committee on Agriculture, FIFRA Extension. Hearing. 96th Cong., 1st sess., 1979, pp. 21-27, 30-32. For examples related to predator control see U.S., Congress, Federal . . . Review of FEPCA, 1973, pp. 12-21; U.S., Congress, Pesticide Oversight. Hearings. 1974, pp. 27, 43; and U.S., Congress, Senate, Subcommittee on Agricultural Research and General Legislation of the Committee on Agriculture and Forestry, Extension of the Federal Insecticide, Fungicide, and Rodenticide Act. Hearings. 94th Cong., 1st sess., 1975, p. 102.

C H A P T E R V
TESTING FOR SAFETY

A Science Based Language

In dealing with FIFRA, legislators speak the language of rational decision making, heavily based on science. Hearings are held in order to weigh all the evidence and to get all the needed information, scientists are invited to testify because of their expert knowledge, and the law is revised in order to allow for more scientific input. All this gives the appearance that the legislative changes to FIFRA are based on a careful consideration of the available scientific evidence. In reality congressional failure to even address most of the problems with FIFRA noted in the many reports described in Chapter Three, indicates that much information necessary for rational decision making is ignored. The ignoring of so much reliable information suggests that most congressmen do not even begin to objectively consider the available scientific and other evidence in order to base their

political value decisions on a reasonably sound basis of knowledge. Of course most legislators are scientific laymen and none have the time to master all the relevant information, but there is not even an attempt to approximate an objective perspective. Much of the information that is ignored is in easy to read, concise form (such as GAO reports) and well known to many persons interested in pesticide policy. Instead of attempting to achieve an objective understanding, the legislators look subjectively at the facts and selectively take note, in their speech and action, of those aspects of the available data which support their value choices.

There are many scientists whose opinions provide strong support for the value choices of legislators. Many of these experts are financially supported or assisted by the industry. There are also many scientists whose opinions are in direct contradiction, but this latter group is more or less ignored. Congressmen tend to selectively choose their scientists, theories and reports. Thus in the area of pesticide policy, science is less a tool for objective assessments of reality and more a means of mobilizing support for political goals. This does not mean that it is not important. For those legislators intent on weakening FIFRA, it is a source

of support for decisions which might otherwise prove to be unpopular. For EPA administrators it is the basis of registration decisions. The relatively few legislators who attempt to objectively assess the pesticide issue try to base their decisions on an accurate understanding of the scientific dimensions of the issue. For these lawmakers it is often difficult to obtain accurate, unbiased scientific information. There are many scientific unknowns in this area of policy and the scientific data related to the examination of the unknowns is extremely voluminous and complicated. There are many scientists who interpret the available evidence in such a way as to support, more or less, the environmentalist's policy perspective. Many other scientists interpret the data in such a way as to support the industry position. No attempt will be made here to prove on scientific grounds that one side's opinion is more valid than the other's. That would be an endless exercise as is the debate between the two groups. What is argued in this and the next two chapters is that the pesticide manufacturers exert a very significant amount of influence in the mobilization of science in support of their viewpoint and interests. Exactly how much influence is exerted is difficult to determine because of the

extensiveness of the industry relation to science. However the evidence indicates that this influence is quite significant.

Some have accused the industry of intentionally distorting scientific data in order to support its own interests. Evidence of intentional distortion exists, but what is most important about the industry relation to science is the effect which this economic relationship tends to produce even if we assume that all researchers are honest. This dissertation will argue that the economic relationship of the industry to much of the scientific infrastructure which produces scientific data related to the safety of pesticides is inconsistent with the public's interest in having all of this infrastructure produce as accurate as possible assessments of the effects of pesticides on human health and the environment. The industry's primary interest is in making a profit, not in safeguarding public health. A great deal of evidence indicates that, at the least, in areas of real controversy in which honest people differ on principles of science, the pesticide manufacturers exert very significant influence. At other times the results of research are distorted, that is, they are interpreted in ways which most scientists would consider

to be in error. This distortion is, evidently, sometimes deliberate and sometimes, perhaps, the unconscious result of such pressures as the economic need to get a new product on the market. Distortion of data does not involve honest opinions concerning the applicability of scientific principles. It involves sloppy lab work, the reporting of nonexistent data, and some fraud. The extent to which fraud is involved is extremely difficult to determine, but the evidence summarized in the following pages suggests that it is, at the least, quite significant. One problem with determining fraud is that it is often quite difficult to distinguish it from unintentional errors, or for that matter, to distinguish fraud or unintentional errors from legitimate differences of scientific opinion.

This chapter and the two following it will explore the relation of the industry to the scientific infrastructure which produces the information used by administrative decisionmakers when deciding on whether or not to register a pesticide, and by legislative decisionmakers who are considering revisions of FIFRA. This chapter will look more extensively at a subject already touched on in Chapter III, that is how pesticides are tested prior to registration. The next chapter will look

at the relation of the industry to the academic scientific community. The chapter after that will examine the industry's relation to cancer testing.

This chapter will describe the statutory requirements for pesticide testing and then describe the testing situation as it has evolved since 1972.

Requirements for Testing and Problems

Testing requirements. FIFRA requires that all pesticides be registered. In order to register a pesticide (or to reregister one that was registered under the pre-1975 rules) many tests related primarily to the safety of the product must be conducted. These costly procedures include tests for acute toxicity and for carcinogenicity. Tests must also be submitted to the Agency so that it can set "tolerances" of maximum pesticide residues permitted on foods in accordance with the Food, Drug and Cosmetic Act. These tests are the basis of the EPA's judgement that registered pesticides are safe. They are also often referred to by legislators as indications that a specific pesticide is not harmful. The responsibility for conducting pesticide testing is placed on the manufacturer. The role of the

EPA is merely to specify in published guidelines what tests are necessary and to check submitted test results for completeness and validity.¹ This procedure is similar to the requirements of the FDA in its regulation of drugs, and some of the problems encountered by the EPA in the regulation of pesticides are similar to those experienced by the FDA. From the beginning, much of the industry testing has been, at best, sloppy and the EPA monitoring of the quality of this testing has been poor.

Early indications of problems. There were around 35,000 pesticides which had been registered prior to the stricter rules for registration which had been mandated by the 1972 FIFRA and which became effective in 1975. These chemicals had to be reregistered by the EPA. The reregistration effort involved, primarily, collecting and cataloguing the test data related to each product, determining what data was needed to meet the new, stricter standards and informing registrants of the new data needs. It did not, for the most part, involve checking the data on hand for validity. Most of the products being reregistered had been previously registered by the USDA and the data proving their safety

was assumed by the EPA to be valid.² It was assumed to be valid even though considerable evidence had suggested otherwise. In 1969 a DHEW Commission reviewed seventeen industrially sponsored studies on the carcinogenicity of DDT. It concluded that fourteen of the studies were so inherently defective that they precluded any possible determination of carcinogenicity.³ In 1971, an Agency review of data used to register the pesticide Aldrin/Dieldrin indicated deficiencies which eventually led to the removal of the product from the market in 1977.⁴ A review in 1974 of the data supporting the safety of Heptachlor/Chlordane revealed that this chemical had the potential for causing cancer.⁵ Most uses of this product were suspended in 1975. In both reviews it was found that the initial histologic examinations were, at best, extremely conservative. The independent re-viewing pathologists diagnosed many more cancerous and precancerous tumors in the test animals than did the original laboratory pathologists.⁶

Kennedy and others discover the problem. In January 1976 Senator Kennedy's Subcommittee on Health held hearings which investigated the testing practices of pesticide and drug companies.⁷ In preparation for the hearings

four EPA scientists reviewed a sampling of the safety testing data in EPA files which had been used to support registrations. Their review discovered faulty and incomplete data.⁸ In the hearing, EPA Deputy Administrator John Quarles testified that serious problems might exist concerning the safety testing data and he announced that a more extensive review of the data would be commenced.⁹

The issue of the data gained more attention. In the same month as the Kennedy hearings the GAO issued a letter report to Administrator Train criticizing the Agency for having no program to check the validity of data and pointing out that other agencies did have such programs.¹⁰ In February and March a Subcommittee of the House Committee on Government Operations included an examination of the problem in its hearings.¹¹ In April the review promised by Administrator Quarles was completed.¹² The reviewing independent scientist, Dr. Melvin Reuber, examined twenty-five studies which had been submitted to the Agency to support the registration of twenty-three pesticides. He found that of the twenty-five studies, one was satisfactory. The others were in his words, "uniformly bad."

There were basially two categories. One in which enough data may have been submitted, but had not been properly analyzed to draw any conclusions; and

the second group in which not even enough data had been submitted to draw any conclusion.¹³

Evidence continued to accumulate. Most of this evidence indicated that the industry testing of pesticides as called for by FIFRA was leading to poor results and that the EPA had done a very poor job of monitoring the quality of this testing. An EPA sampling of correspondence files in preparation for further hearings held by Kennedy showed that FDA and EPA scientists in prior reviews (some dating back to the early 1950's) had discovered deficiencies in the data similar to those found by Reuber.¹⁴ This was reported to the Kennedy subcommittee in the hearings which were held in April as a follow-up to the January hearings.¹⁵

In December 1976, the staff of Kennedy's subcommittee issued a report which included a description of the data issue. It noted that much of the data was poor in quality and that the EPA had not done much to audit the laboratories which produced it.¹⁶ It blamed the Agency for poor administration and concluded that probably many of the pesticide products on the market would be found to be unsafe if the EPA regulated pesticides in the way it is required to under the law.¹⁷

Industrial Bio-Test. The biggest revelations concerning the inadequacy of the data and the extent of this problem were the result of the investigation of Industrial Bio-Test Laboratories (IBT). This laboratory was, at the time, the nation's largest commercial toxicological testing company. Commercial laboratories are hired by many pesticide companies to do the testing required by the EPA for their products. They are also hired by drug and cosmetic companies to meet the FDA's testing requirements for their products. Industrial Bio-Test has performed very many studies on not only pesticides, but also drugs, cosmetics and other chemicals in order to fulfill the statutory requirements of testing for these chemicals. In 1975 an official of the FDA in checking a tip that there were problems with tests submitted by a drug manufacturer mistakenly pulled a file on IBT. In reading the file he found enough problems to warrant an inspection.¹⁸ In April 1976 and again in June the FDA inspected the laboratory and found "very serious irregularities."¹⁹ On April 13, 1977 Federal inspectors arrived at Northbrook, Illinois so that they could again inspect the laboratory. The next morning they were met by A. J. Frisque, the President of IBT, who told them, "Gentlemen, I am very sorry. There has been an un-

fortunate misunderstanding; all of our records were destroyed last night."²⁰

Between 1976 and 1978, much of the IBT data which was not destroyed was audited.²¹ These audits were done cooperatively by the FDA and EPA and covered both drugs and pesticides. The results of the audits indicated many problems. For example poor record keeping raised doubts that test animals did in fact receive test material at the proper dosage. In many studies few, if any, observations of the animals were performed during the course of the studies even though such observations were called for in the protocol.²² All damaged tissue in test animals was not examined, but it was reported to be examined. A study which was actually run for eighteen months was reported as twenty-four months long.²³ Extra animals may have been kept for the entire length of some studies and poor animal identification methods existed. These problems allowed for the possibility that selective substitution of animals was made at the time the animals were killed.²⁴ Poor record keeping also led to animals which had been reported as dead, being reported as alive later, a claim the FDA inspectors were unwilling to believe. In a hearing held by Senator Kennedy's subcommittee in July 1976 Dr. M. Adrian Gross of the FDA

testified.

Dr. Gross: With reference to pathology operations, many animals died several times.

Senator Kennedy: What do you mean died several times?

Dr. Gross: Well, at least that is what the records indicate. We do not believe they actually died several times, yet this is what the company records indicate.²⁵

In August 1977 the EPA announced that thirty-one pesticide companies had been asked to audit and certify the accuracy of tests performed by IBT. A total of 123 pesticide products and 160 tolerance levels for residues on food were covered in this request.²⁶ The Agency said that it would not cancel the registration of these products even though their claims of safety had been shown to be based on invalid tests. Thus as the Administrator of the EPA has admitted, it is unknown whether or not these products, which are registered under FIFRA and sold legally, are safe.²⁷ Finally in July 1980, the Agency announced that in cases where virtually the entire data base was invalid and there was a strong possibility of substantial health risk, it would consider cancellation.²⁸ This, however, left open the possibility that

unsafe chemicals would be registered. If some, but not "virtually all," of the data supporting a registration was invalid, it was possible that dangerous properties of the chemical had not been detected. In any event all of the pesticides involved are still registered.²⁹ The final note on Industrial Bio-Test is that recently four top officials of the company were indicted for allegedly falsifying health tests conducted between 1970 and 1977 on pesticides and drugs.³⁰

IBT an isolated case? The EPA has maintained that the IBT problem is an isolated case, however, in addition to that which has already been discussed, there is significant evidence to dispute this claim.³¹ Samuel S. Epstein is a professor of Occupational and Environmental Medicine who has, over the last seventeen years, become involved in a wide range of issues related to chemicals for congressional committees, Federal agencies, and the media. This involvement has given him the opportunity to examine raw data submitted to agencies and decisionmaking bodies. Dr. Epstein's experience has led him to conclude that testing data is not sound, valid, honest, or directed toward the public interest.³² According to him:

Escalating evidence shows that constraints on data - from gross inadequacy, biased interpretation, manipulation, suppression, and even to outright destruction are commonplace, especially when profitable technologies are involved. Alarmingly, such evidence now justifies strong reservations as to the validity of any data developed by institutions or individuals whose economic interests are directly or indirectly affected.³³

Epstein emphasizes that:

We are not dealing with aberrant exceptions; we are dealing with the rule rather than the exception.³⁴

The most common problem, he notes, is the poor quality of industrially generated data.³⁵

In February 1976 in testimony before a subcommittee of the House Committee on Government Operations, three former EPA attorneys who had recently resigned in protest over the Agency's poor enforcement of FIFRA claimed that the recent Senate hearings on laboratory testing had only scratched the surface. They maintained that, " . . . examples of inaccurate and sloppy data in EPA files are legion," and that, " . . . the data underlying the registration of a substantial number of widely used pesticides do not support their safety as required by law."³⁶ They pointed out that in the three regulatory actions taken by the Agency against DDT, Aldrin/Dieldrin, and Heptachlor/Chlordane, the evidence which proved the chemicals to be hazardous was based largely upon independent review

of data submitted by industry in order to support claims of safety.³⁷

The GAO letter report of January 1976 revealed that while many EPA people thought that submitted data was accurate and reliable, other Agency officials said that reports were oversummarized, attempted to lead reviewers to favorable conclusions, and could contain false data that EPA might accept.³⁸ Furthermore, the report of Senator Kennedy's subcommittee criticized the Agency for ignoring early and repeated warnings that the data it was relying on was faulty and incomplete.³⁹

This evidence supports the contention that problems with laboratory data are commonplace, but the laboratory testing problem is not one particular to pesticides. For example data indicating adverse effects has been distorted or suppressed for vinyl chloride, Red-40, (a food dye), Nitritotriacetic Acid (NTA), benzene, MER/29, Dornwall, Aldactone and Aspartame.⁴⁰

The EPA: An Unenthusiastic Auditor

The EPA did initiate a joint audit program in 1977 with the FDA, however given the past performance of the Agency and the views of many Agency people it does not

seem that the audit program will provide vigorous monitoring of test results. The GAO report of January 1976 which described the concerns of some Agency personnel about the quality of data also related that many EPA people said that the data was accurate and reliable.⁴¹ A memo summarizing a 1976 EPA staff meeting notes strong criticism of Dr. Reuber's findings that submitted tests were deficient.⁴² In a recent interview an EPA official told the author that he believed that most of the industry data was good. He did not feel that in reregistering pesticides it was necessary for the Agency to validate the data. Attitudes such as this seem common at the EPA even in the face of some of the evidence just described.

Another indication of the Agency's attitude toward auditing can be seen in the fact that it was more or less pushed into it. Despite the early findings on DDT, Aldrin/Dieldrin, and Heptachlor/Chlordane, and the early discoveries of inadequate data by EPA scientists it was not until the GAO suggested an audit program that the Agency began one.⁴³ The GAO suggestion was politically difficult to resist in the face of the FDA discoveries at Industrial Bio-Test, the findings of Dr. Reuber and other EPA scientists, and Senator Kennedy's hearings

and report.

The Agency's actions in relation to the laboratory data problem have appeared to be motivated by an attempt to avoid conflict, to scale down the size of the problem, and to prevent developments which might fuel controversy. If a vigorous inspection program were to find that even more data was invalid, political pressure from such actors as Senator Kennedy and his subcommittee would probably be exerted in the direction of a demand for suspension of the registration of pesticides whose safety had not been determined. This would lead to industry complaints and industry lobbying with the Agriculture committees, a much more influential force in pesticide policy. The Agency would then be faced with the difficult choice of permitting more and more chemicals whose data bases had been shown to be invalid to remain on the market, or risking a loss of funds and passage of yet another amendment weakening FIFRA. In the face of these considerations the divergence of opinion between such scientists as Dr. Reuber and Dr. Epstein on the one hand, and many EPA officials on the other, is more easily understood. It is, evidently, perceived by EPA officials that it is in their interest to avoid conflict and maintain a stable regulatory environment. If this is

true, it is not likely that a vigorous auditing program will be run by the Agency.

Economic Influences on Scientific Judgement

Have the laboratories of the testing companies and chemical companies intentionally manipulated the data or are the distortions inadvertent? Some of the evidence just examined would seem to suggest that outright, intentional manipulation is a not uncommon occurrence. One company has entered a "no-contest" plea to a charge (made by the EPA) that it withheld research results which indicated that two of its pesticide products might cause cancer.⁴⁴ Perhaps more common, however, is the subjective interpretation of data in terms favorable to industry. Some of the tests, particularly those for carcinogenicity, are based on scientific theories that are not completely proven. Since the nature of cancer and the mechanism of its causation is still not thoroughly understood, the interpretation of tests for carcinogenicity involves a certain degree of subjective judgement concerning the meaning of collected data. Very often it appears that if the data has not been intentionally manipulated, at the least, the subjective judgement of

the scientist conducting the experiment has been exercised in such a way as to favor very much the interests of the manufacturers at the expense of the general public. The exercise of judgement in this manner may be an unconscious process influenced by the economic structure within which the judgement is made. Whether it is an unconscious process or an intentional distortion it certainly is consistent with the economic interests of both the manufacturers and the laboratories.

Under the present testing system, the economic interest of the testing laboratory is in arriving at results which prove the safety of the client's products at the least cost to the laboratory. It seems unlikely that the management of a testing laboratory will be unmindful of the need to secure future testing contracts when testing a client's product. Conflicts of interest are inherent in the process. The supposedly neutral testing laboratory is dependent on the owner of the product being tested for future business. The pressures on scientists working in pesticide company laboratories are even more apparent. Within this system of economic interests it seems that the exercise of subjective judgement is very often influenced (perhaps unconsciously) in such a way as to favor the economic interests of the

companies rather than the interests of public health or the environment.

Another factor influencing judgement is the need to save time and money. It is faster and cheaper for a laboratory to cover up mistakes than to repeat costly tests. This motivation would appear to explain many of the deficiencies found in the data.

Whether the data is intentionally manipulated or unconsciously interpreted in a manner consistent with the economic interests of the manufacturers, the end result is that science is interpreted in a way that is in their interests. It is distorted away from its supposed objective of describing the truth toward supporting the special interests of the companies by legitimatizing their products. Even if we assume that the theoretical assumptions underlying the laboratory scientists' interpretations are sincerely believed by them, the process still distorts science because the many scientists who believe theories which would lead to much different interpretations of the data are excluded from the process. The interpretations of test data offered by the companies strongly suggest that in hiring scientists and contracting for laboratory work, the pesticide companies can and do pick their scientists carefully. They do not tend to hire

scientists who believe theories which would lead them to regard many controversial substances as carcinogenic. They hire scientists whose assumptions concerning carcinogenicity lead them to believe that they are not carcinogenic. Thus the testing of chemicals to support the registration of pesticides tends to be done not by scientists with different points of view, but by those whose point of view coincides with the manufacturer's interests. Reality thus tends to be viewed from only one scientific perspective. Other perspectives which might offer a more thorough understanding are excluded.

Other Ways To Do Testing

There have been several suggestions made which would alter the institutional basis within which testing is accomplished. The main thrust of these proposals is that testing should be either supervised or conducted by a party whose primary motivation is in protecting the public interest rather than maximizing profits. For example testing might be ultimately funded by industry, but the actual assignment of testing contracts made by a government agency. The agency could contract with private laboratories to do testing, audit the performance of the

laboratories, and charge the pesticide companies a fee to cover its costs (including the costs of the testing contract). The results of tests would be reported to the Agency and the private laboratories would not be told whose product they were testing. This would eliminate the economic incentive for the laboratories to find results favorable to industry. Contracts would be assigned on the basis of past performance (determined through audits) rather than on the basis of past toxicological results favorable to industry. Responsibility on the part of the laboratories could be further encouraged by making them liable for any damages which resulted to the public as a result of negligence in the testing process. Another proposal that has been made is for government agencies to do all testing.⁴⁵

These types of reform would bring about a fundamental change in the economic relation of the pesticide (and drug) companies to those doing the testing of their products. Probably because of this consequence, they have never been seriously considered even though there have been efforts made to introduce them. In the 1976 Kennedy Subcommittee hearings Senator Gaylord Nelson discussed the very similar problem of testing drugs. The Senator noted that the problem had existed for a long

time and that his proposed bill for reform had never been seriously considered.

We introduced it seven years ago in 1969. We introduced it in 1971. We introduced it in 1975. I have not seen a single agency thus far endorse the concept or the idea or be excited or interested in it.

So it ends up languishing here.⁴⁶

Instead of seriously considering the changing of the economic basis of testing, most congressional criticism has admonished the EPA to do a better job of checking the validity of the data. Given the understaffing of the EPA, its tendency to avoid controversy, and its past history in regard to this issue, this approach is not likely to solve the problem.

To summarize the argument being made this far, regulators seeking accurate information about pesticides and their effects will not confront a body of knowledge founded on an unbiased search for the facts. The evidence strongly indicates that pesticide manufacturers exert a very significant amount of influence in the mobilization of testing science in support of their viewpoint and interests. This is one aspect of the influence exerted by the companies. Basically this influence is exerted in two ways: first, by submitting their own test data to support the registration of new pesticides and the

reregistration of old ones, and second, by mobilizing many of the other information generating resources of pesticide related science to their advantage. We have just dealt with the first of these and we will now deal with the second. A primary focus of the manufacturers in this area is in the land grant universities.

NOTES TO CHAPTER V

¹The EPA does do some testing of pesticides as do other agencies such as the National Cancer Institute; however this testing is limited. The primary responsibility for testing is with the manufacturer.

²U.S., Congress, Senate, Committee on Agriculture, Nutrition and Forestry, Extension of the Federal Insecticide, Fungicide, and Rodenticide Act, S. Rept. 334 to Accompany S. 1678, 95th Cong., 1st sess., 1977.

³Samuel S. Epstein, "Constraints In Decision-Making," in Annals New York Academy of Sciences, vol. 329: Public Control of Environmental Health Hazards, eds. E. Cuyler Hammond and Irving Selikoff (New York: New York Academy of Sciences, 1979), p. 310.

⁴U.S., Congress, Senate, Subcommittee on Administrative Practice and Procedure of the Committee on the Judiciary, The Environmental Protection Agency and the Regulation of Pesticides, Committee Print (Washington, D.C.: Government Printing Office, 1976), p. 24.

⁵Ibid.

⁶Ibid, p. 25.

⁷U.S., Congress, Senate, Subcommittee on Health of the Committee on Labor and Public Welfare, Preclinical and Clinical Testing By the Pharmaceutical Industry 1976, Joint Hearings, Part II. 94th Cong., 2d sess., 1976.

⁸U.S., Congress, The Environmental Protection Agency and the Regulation of Pesticides, Committee Print, 1976, p. 6.

⁹U.S., Congress, Preclinical and Clinical Testing . . . Joint Hearings, Part II. 1976, pp. 131-135.

¹⁰The report can be found in U.S., Congress, House, Subcommittee on Conservation, Energy and Natural Resources of the Committee on Government Operations, EPA's Implementation of the Pesticides Control Act, Hearings. 94th Cong., 2d sess., 1976, p. 12.

¹¹U.S., Congress, EPA's Implementation . . . Hearings. 1976.

¹²Melvin D. Reuber, "Review of Toxicity Test Results Submitted In Support of Pesticide Tolerance Petitions," in U.S., Congress, Senate, Subcommittee on Health of the Committee on Labor and Public Welfare, Preclinical and Clinical Testing by the Pharmaceutical Industry, 1976, Joint Hearings, Part III. 94th Cong., 2d sess., 1976, pp. 621-647.

¹³Ibid., p. 649.

¹⁴U.S., Congress, The Environmental Protection Agency and the Regulation of Pesticides, Committee Print, 1976, pp. 27, 28.

¹⁵U.S., Congress, Preclinical and Clinical Testing . . . Joint Hearings, Part III. 1976, pp. 573-575.

¹⁶U.S., Congress, The Environmental Protection Agency and the Regulation of Pesticides, Committee Print, 1976, pp. 1, 4.

¹⁷Ibid., p. 34.

¹⁸Paul Merrell, "The Industrial Bio-Test Caper," NCAP News, Winter 1981, p. 2.

¹⁹U.S., Congress, Preclinical and Clinical Testing . . . Joint Hearings, Part III. 1976, p. 729.

²⁰Samuel S. Epstein, "Information Requirements of the Public," American Industrial Hygiene Association Journal 40(December 1979): 1153.

²¹U.S., Comptroller General, Delays and Unresolved Issues Plague New Pesticide Protection Programs (Washington, D.C.: Government Printing Office, 1980), p. 55.

²²U.S., Congress, Senate, Subcommittee of the Committee on Appropriations, Department of Housing and Urban Development, and Certain Independent Agencies Appropriations For Fiscal Year 1980, Hearings, Part I. 96th Cong., 1st sess., 1979, p. 824.

²³"EPA Reports Major Differences In Tests of Pesticides Rated Safe," New York Times, 16 August 1977, p. 23.

²⁴U.S., Congress, Department of Housing . . . Hearings, Part I. 1979, p. 824.

²⁵U.S., Congress, Preclinical and Clinical Testing . . . Joint Hearings, Part III. 1976, p. 729.

²⁶"EPA Reports Major Differences In Tests of Pesticides Rated Safe," p. 23.

²⁷U.S., Congress, Preclinical and Clinical Testing . . . Joint Hearings, Part III. 1976, p. 575.

²⁸Merrell, p. 3.

²⁹Ibid.

³⁰"U.S. Charging 4 Falsified Reports on Drugs In Lab," New York Times, 23 February 1981, p. A14.

³¹U.S., Congress, Department of Housing . . . , Hearings, Part I. 1979, p. 827.

³²Epstein, "Information Requirements of the Public," p. 1152.

³³Samuel S. Epstein, "Polluted Data," The Sciences 18 (July/August 1978): 16.

³⁴Epstein, "Information Requirements of the Public," p. 1157.

³⁵Epstein, "Constraints In Decision-Making," p. 310.

³⁶U.S., Congress, EPA's Implementation . . . , Hearings. 1976, pp. 6, 34.

³⁷Ibid., p. 34.

³⁸See U.S., Congress, EPA's Implementation . . . , Hearings. 1976, p. 13.

³⁹U.S., Congress, The Environmental Protection Agency and the Regulation of Pesticides, Committee Print, 1976, p. 34.

⁴⁰For vinyl chloride see Samuel S. Epstein, "Cancer and the Environment," Bulletin of the Atomic Scientists, March 1977, pp. 22-30. For Red-40, NTA, and benzene see Epstein, "Information Requirements of the Public." For MER/29, Dornwall, Aldactone, and Aspartame see Epstein, "Constraints In Decision-Making."

⁴¹Report in U.S., Congress, EPA's Implementation . . . , Hearings. 1976, p. 13.

⁴²U.S., Congress, Preclinical and Clinical Testing . . . Joint Hearings, Part III. 1976, pp. 654-655.

⁴³Report in U.S., Congress, EPA's Implementation . . . , Hearings. 1976, p. 13.

⁴⁴William Robbins, "Hard Times Hit Heineman's Northeast," New York Times, 10 July 1980, pp. D1, D5.

⁴⁵U.S., Congress, Preclinical and Clinical Testing . . . Joint Hearings, Part III. 1976, p. 690; Epstein, "Information Requirements of the Public," p. 1157.

⁴⁶U.S., Congress, Preclinical and Clinical Testing . . . Joint Hearings, Part II. 1976, p. 157.

CHAPTER VI

INDUSTRY AND ACADEME

There has in recent years been an increase in financial support from business for higher education. In the last few years, universities have received the largest increase in financial support from business since 1920.¹ Substantial support from industry is not, however, a new trend in the schools of agriculture. The manufacturers of pesticides, along with other agribusiness concerns, have long had a close relation with the colleges of agriculture of the land grant universities and their associated experiment stations and extension services. The land grant colleges are the locus of a great deal of research concerning agriculture, and most pest control recommendations emanate from here.²

A recent book for managers entitled The Regulation Game instructs businessmen on how to co-opt university based experts.

Regulatory policy is increasingly made with participation of experts, especially academics. A regulated firm or industry should be prepared

whenever possible to co-opt these experts. This is most effectively done by identifying the leading experts in each relevant field and hiring them as consultants or advisors, or giving them research grants and the like. This activity requires a modicum of finesse; it must not be too blatant, for the experts themselves must not recognize that they have lost their objectivity and freedom of action.³

This generalization is true of agriculture but probably less applicable there than to other disciplines in the university. The ties between the schools of agriculture and agribusiness are so extensive that a minimum of "finesse" is needed in co-opting university scientists. Indeed it is more accurate to describe agribusiness as a part of the land grant community rather than a wealthy client. The greatest impact is exerted through research investments and through frequent contacts with research staff. Continued university support for industry is maintained by grants for research and scholarships, by lending political support for increases in funds to the schools, and by a similarity of attitudes and objectives.⁴

The Entomologists

In order to describe the relation of industry to the agricultural colleges, we will first focus on one

discipline within the colleges, entomology. We will then examine the relation of the industry to an agricultural university, the University of California being the example selected.

Finally we will look at a group of scientists who provide information about agricultural issues.

The entomology profession is important because entomologists are probably the most directly concerned with the making of recommendations on how to control plant pests. A similar relation to industry can also be seen, however, in such disciplines as plant pathology, weed science, forestry and agronomy.⁵ The professional organization of the entomologists is the Entomological Society of America (ESA). The original ESA was founded in 1906 and it was dominated by academic scientists primarily interested in basic research. The original members were biologists working on insects, taxonomists, morphologists, physiologists, zoogeographers and ecologists.

In 1952 the ESA merged with the American Association of Economic Entomologists. This group had been formed in 1889 essentially as an organization for entomologists working in the new agricultural experiment stations. It included chemists, toxicologists and others primarily

concerned with the destruction of insects. The merger was evidently based on a desire for strength in numbers and a bigger financial basis, and a desire to link basic and applied research more closely. The merger was not, however, approved unanimously by the original ESA membership. It caused the resignation of a group of basic biologists and led others to boycott meetings. Since that time the dominant voice in the ESA has seemed to be the economic entomologists.⁶

With the discovery during World War II of the insecticidal properties of DDT the pesticide industry expanded greatly. DDT was inexpensive, long-lasting, broadly toxic and worked better as an insect killer than anything that had ever been used.⁷ DDT also raised the status of entomologists. Chemical companies focused substantial attention on them in an effort to gain recommendations for their products.⁸ According to the late Robert van den Bosch who was a well known entomologist at the University of California,

Entomologists and other pest-control specialists were sucked into the vortex and for a couple of decades became so engrossed in developing, producing and assessing the new pesticides that they forgot that pest control is essentially an ecological matter. Thus, virtually an entire generation of researchers and teachers came to equate pest management with chemical control.⁹

The uncritical attitude of the ESA toward pesticides is reflected in its choice of speakers at its national meetings. In his book The Pesticide Conspiracy published in 1978, van den Bosch points out that since the 1962 publication of Rachel Carson's Silent Spring, not one strong critic of the pest-control status quo has spoken before a plenary session of the Society or participated in one of its major symposia. Instead they hear such speakers as the president of the National Agricultural Chemical Association (NACA), the chief Washington lobbyist for NACA, and Congressman Jamie Whitten, a good friend of agribusiness.¹⁰

Similarity of opinion. The close relation between many entomologists and the pesticide manufacturers is not merely the result of industry money. There seems to be a similarity of opinion, a shared way of looking at things which forms an important part of the basis of this relationship.

Several writers have attempted to understand the philosophical perspective of those scientists who more or less uncritically advocate the use of pesticides. Roland Clement paraphrasing A. N. Whitehead, describes a narrow positivism which focuses on imminent hazards

to man without considering long term effects.¹¹ The positivist is too modest to go searching for connections that have not appeared. He simply states what he sees and only what he sees. The rigid assumption of their modesty is that we already know what "system" is. What our systems cannot organize, nothing can organize. The physical sciences deal in "types of things" (atoms, molecules) and are thus typological, but when life enters, every organism and every ecosystem has a history that continually modifies it and makes it at least somewhat unique. The exact replication of experimental reactions which the chemist considers his test of truth becomes only somewhat attainable where unique things (rather than types of things) are involved.¹² Another way of saying this is that biological experimentation often can not be as conclusive as physical experimentation because the variables involved are so numerous, they are not all thoroughly understood and sometimes are not even known.

Modesty in searching for connections has led to a reductionist tendency to search for answers only within one's own discipline. The specialist is often not interested in looking outside his area of knowledge into such areas as ecology, a field which makes use of

knowledge from several disciplines. Thus Frank Egler, a plant ecologist, has complained that the agricultural, forestry, and horticultural sciences are, "thought to be completely independent of the rest of the ecosystem .

. . .¹³ "This way of thinking," he maintains, "is precisely at the root of the entire pesticide-ecosystem problem."¹⁴ The problem is not only one of not looking outside one's own discipline but also one of emphasizing a short term view rather than a long term one.¹⁵

What are some of the "connections which have not yet appeared" which the positivist's modesty handicaps his ability to appreciate. They include the long term effects of pesticides on wildlife, insect predators, ecosystems and man. A primary effect on man is the alleged carcinogenicity of many pesticides. The process of cancer causation is not thoroughly understood and the assumption of many agricultural scientists in approaching this body of incomplete knowledge is that until a pesticide is completely proven to be carcinogenic, it is not.

This perspective combines nicely with the interests of industry. Lacking an ecological perspective, university scientists who might otherwise be interested in studying the harmful effects of a pesticide or an ecologically sound means of pest control, are available

to study and support industry products. There is no need to "sell out," only to work within the paradigm.

Ties to industry. The entomologists, along with other agriculturally related disciplines, receive substantial amounts of money from agribusiness. Many professors receive grants from the chemical companies for research on the donor's proprietary materials.¹⁶ Often these grants are comparatively small, but they provide the companies a substantial return. For example a grant for \$2,000 may be made to test a product. It may cost more than \$2,000 to do the tests so the university subsidizes the rest of the work. The university pays the salary of the researcher and the cost of maintaining the laboratory and support facilities, such as the library, which the researcher uses.

In addition to supplying money directly, industry lobbyists are quite active in lobbying for increased funds for many land grant programs.

Close ties are maintained between industry and the ESA. The Society's "Sustaining Associates" include a substantial number of agrichemical companies. They aid the Society by paying inflated annual dues, helping to pay for distinguished speakers, and advertising in

the Society's journal. At meetings of the ESA, company hospitality suites entertain members and some are taken out to dinner.¹⁷ Meritorious researchers or farm advisors are given full expense packages to attend meetings. Others receive paid fishing trips and hunting holidays. Some are even awarded overseas trips.¹⁸

Another industry financial influence is the award. Deserving scientists receive cash awards for their contribution to research. For example at the ESA's annual meeting two top awards are the CIBA-GEIGY (founder's) award and the Velsicol (Bussart) awards which include cash prizes. CIBA-GEIGY and Velsicol are important agrichemical producers.¹⁹ An article in the November 1979 issue of Farm Chemicals, an agrichemical trade magazine, describes an award given to Dr. Thomas Jukes, a professor-in-residence of medical physics, lecturer in nutritional sciences, and research biochemist at the University of California Space Sciences Laboratory at Berkeley. Although Jukes is not an entomologist, the article suggests the role of awards in agribusiness involvement in university research. It reports that the award for Advancement or Application of Agricultural and Food Chemistry was presented at the 1979 annual meeting of the American Chemical Society (ACS). Jukes

was given a plaque and a cash award of \$2,000. The award was presented by ACS's Division of Agricultural and Food Chemistry and sponsored by International Flavors and Fragrances Inc. It honors an outstanding research scientist who has contributed to man's knowledge of food and agriculture. According to the article:

In addition to notable research contributions, Jukes has been recognized for his leadership role taken in countering the irrational concern of certain groups over food additives and residues of pesticides, antibiotics, and other chemicals by injecting a note of balance in the discussions.²⁰

Support for pesticides. The combination of industry money and a lack of ecological perspective has led to a tendency within entomology to emphasize the use of pesticides at the expense of more environmentally sound means of pest control. The emphasis on chemicals is so heavy that Robert Metcalf, a well known entomologist, has complained that his profession is, "seen by many as a farm chemicals auxiliary."²¹ Support for the use of pesticides is sometimes enforced by pressure within the university and within the discipline. In his book, van den Bosch describes a number of examples. He relates how an entomologist at Louisiana State University was subjected to pressure exerted by a chemical company through the university administration

in an effort to suppress his discovery that the company's insecticide had lost its effectiveness against the boll weevil.²² Another researcher was pressured by Mississippi State University administrators to cease his opposition to the fire ant eradication program.²³ Perhaps most revealing is his description of his attempt to enlist the support of some fellow entomologists in the hearings which were held by the EPA when it was considering whether or not to ban DDT. Van den Bosch called, "about a half dozen" entomologists, "who expressed their concern over DDT, felt that it should be banned, and indicated a willingness to talk with Charley (Charles Wurster, a scientist representing the Environmental Defense Fund) about the possibility of testifying in the DDT hearings." These men, van den Bosch maintains, were old acquaintances who were enthusiastic about integrated pest management and who had strongly expressed a resolve to, "turn the pest-control scene around."

When I talked to them on the phone, they were really charged up with a willingness to voice their anti-DDT convictions on behalf of Charlie Wurster and EDF.²⁴

However, by the time Wurster called them they didn't want to have a thing to do with the DDT hearings.

Wurster reported to van den Bosch that each man had expressed fear either of administrative reprisals or of threats to existing or proposed research grants.²⁵

The University of California

A concrete illustration of the effects of agribusiness influence on agricultural research can be seen in author Paul Barnett's description of the University of California.²⁶ California uses about 20 percent of the pesticides used in the United States. The University's scientists have had a crucial role in shaping the state's pest control system. They research the effectiveness of new chemicals, and farm advisors from the University's Cooperative Extension Service recommend to growers which products to use. Many University graduates become farmers, chemical salesmen and government officials.²⁷

Pesticide manufacturers provide strong support for the University's agricultural programs. In fiscal year 1978-1979, companies that manufacture pesticides gave 420 gifts worth \$689,000 to the University's division of Agriculture. This money was used to support the work of research personnel and farm advisors.²⁸

What is the effect of this economic relationship? According to Al Meyerhoff, an attorney for California Rural Legal Assistance, there is no consideration of the social impact of research. In his opinion research at the University is for sale to the highest donor.²⁹ Support for this view is offered by Barnett who cites a 1975 survey of the twenty-five departments in the College of Agriculture on the Davis Campus. The survey attempted to determine the factors which can influence the choice of research topics. The most popular response was, "money can influence what research gets done."³⁰ If this is correct then the \$689,000 donated by the chemical companies must have a significant effect in influencing researchers to do work on pesticides. This ties up University resources which might have been used for research on more environmentally sound means of pest control.

Pest control recommendations made by the University strongly emphasize chemicals. An analysis by the Cooperative Extension Service of 4300 of its published pest control recommendations found that ninety-three percent were for chemical control. The remaining seven percent were for more environmentally sound means of control.³¹

Heavy industry support influences not only what gets studied, but what does not. The University has a program to provide information to the EPA about the risks and benefits of pesticides. The program is based on a number of committees which are formed to provide the EPA with information about pesticides. Many of the scientists appointed to the committees receive grants from pesticide manufacturers. The program reports mostly on the benefits of pesticides and, according to the testimony of its director, does not tend to examine adverse effects.

We are gathering largely benefits data As a rule, we spell out the need for a chemical in California, how important it is, and why we need to keep it. If we came by information showing a greater risk than EPA knew about, then we'd send it to them. We haven't done that though because we don't get that type of information.³²

Those who receive industry money often support their benefactors in testimony or advice given to regulatory agencies. Barnett provides several examples. An environmental toxicologist who has received \$24,900 in gifts from Dow Chemical Company, the manufacturer of 2,4,5T, has supported continued use of this product before the state and federal government. A University of California/Davis entomologist supported an emergency

exemption from registration requirements for Mesurool, a product of Chemagro, a pesticide manufacturer that has given him eighteen gifts worth \$17,975. A farm advisor asked for special local needs registrations for Benlate and Captan. This advisor has received \$12,800 in thirteen grants from companies that sell these products.³³

DBCP. The case of Dibromochloropropane (DBCP) is a particularly vivid example of the effects of the university-industry relationship. In this case university researchers failed to inform workers and regulatory agencies of important findings and failed to conduct further research which would have shown the extent of environmental contamination resulting from this chemical.

DBCP is a soil fumigant which was used by farmers to kill nematodes, worms that eat root tips. It was used mostly in California and Hawaii and, to a lesser extent, by soybean farmers in the Middle West. The only domestic producers of DBCP were the Dow Chemical Company and the Shell Oil Company, but about seventy-five chemical companies would buy the product and blend it with other materials to make various pesticide products.³⁴ About twelve to fifteen million pounds

were produced annually.³⁵

For about a year, beginning in 1976, the workers in one section of the Occidental Chemical Company plant at Lathrop, California were concerned about the fact that none of them were having children. They would discuss this problem during their lunch breaks at the factory where they blended DBCP with other ingredients to produce a final product. Finally, during the summer of 1977 six of them decided to be tested for fertility. All six had very low sperm counts or none at all. This finding led to more tests. It was found that sixty-two of eighty-six Dow employees at a plant outside Magnolia, Arkansas had abnormally low or nonexistent sperm counts. Subsequent analysis has confirmed the correlation between exposure to DBCP and lower sperm counts and sterility.³⁶

The evidence concerning its damaging effects led Dow Chemical to halt the production of DBCP in August 1977, and to recall all stocks of the chemical later that month.³⁷ The product was banned in California, and in September the Federal government moved to suspend its use on nineteen vegetable crops and limit worker exposure.³⁸ Later it was discovered that DBCP contamination was widespread. It was determined that it

had been present in fruit and vegetable crops, that it persisted in soil for more than a year, and that there was widespread contamination of water.³⁹ California officials discovered that 155,000 people had been drinking water contaminated by DBCP and they ordered more than forty municipal wells shut down.⁴⁰

Why did such extensive exposure of the population occur within a regulatory system which is supposed to protect the public from this type of exposure? The primary reason is that the Federal government was never notified of the results of several tests completed years earlier.

Perhaps the most important test was supervised by Dr. Charles Hine of the University of California in 1958. Hine tested rats for the effects of exposure to DBCP at various concentrations. At a level as low as five parts per million (ppm) he found that in half the animals tested the effects varied from degeneration of testicular epithelium with atrophy to complete degeneration with complete azoospermia (absence of spermatozoa in the semen). At higher concentrations of the chemical, the effects were more severe.⁴¹ This test was an indication that DBCP might harm workers exposed to it. Dr. Hine did not inform the workers or government officials. He also

did not conduct further tests to determine if there existed a level of exposure which was safe.⁴²

In October 1977, the California Department of Industrial Relations held hearings on DBCP to investigate why such a harmful substance had been overlooked and allowed on the market. Dr. Hine was among the witnesses. He testified that although he had been employed by the University and used its laboratory when he did his work in 1958, the work was supported by a grant from Shell and reported to them on a confidential basis. The lowest level of exposure at which he had tested his rats was five ppm. Therefore he did not know what would happen at lower levels of exposure. He assumed, however, that exposure at one ppm would be a "no effect" level (a level of exposure at which no harm occurs) although he had no data to prove this. Hine recommended this level to Shell, but also recommended further studies. When Shell said they would not be necessary, he dropped the subject. In the hearings he expressed the opinion that he should have continued testing in order to determine what level of exposure was safe.⁴³ "I think we should have gone to a no-effect level and I admit the error in this thing."⁴⁴ He agreed with the hearing officer that his research priorities were set by a

"market place concept," and that they were a matter of, "who is going to come up with the money to do what you've considered objective research."⁴⁵

The one who has come up with the money for a substantial portion of Dr. Hine's career has been the Shell Chemical Corporation. Since 1947, Shell has contributed approximately \$400,000 to his university research projects. He also receives consulting fees from Shell. The Oil, Chemical and Atomic Workers Union has filed suit against Dr. Hine and the Shell Chemical Company. The suit, which was filed on behalf of twenty workers sterilized by DBCP, claims that the workers were harmed because he suppressed evidence that the chemical damaged the testicles of experimental rats.⁴⁶

The results of the study supervised by Hine and one done by Dow scientists which indicated a similar effect were published in 1961, however the workers and appropriate government agencies were not notified.⁴⁷ Commenting on these studies in 1979, Dr. Marvin S. Legator of the Department of Preventive Medicine and Community Health, University of Texas Medical Branch referred to a problem of "the nonutilization of data." Writing in the Annals of the New York Academy of Sciences he said:

It is hard to understand how after the conducting and reporting of an excellent toxicological study by two of the largest corporations in the United States, the toxicological findings were totally disregarded by the sponsors of the study. The problem in germinal cells at the lowest level studied of 5ppm was clearly evident in this investigation. It is even more bewildering to understand how industry could have exposed its workers to this chemical without even attempting to check the effect of this chemical on the exposed employees.⁴⁸

Dr. Hine was not the only university scientist who ignored the adverse effects of DBCP. In 1965 a nematologist at the University of California/Davis reported to the administration that studies had shown that tomato seedlings absorb DBCP through their roots and translocate it upwards. This result was never published because, according to the investigator, "that wasn't our purpose. We were just testing DBCP movement in soil."⁴⁹ Not knowing of the studies, the Food and Drug Administration assumed that no residue would appear in produce because DBCP is applied to the soil, not the plant.⁵⁰ The analysis of the movement in soil was also less than adequate. Tests indicated that DBCP was highly soluble in water and had a low affinity for soil, but the researchers at California did not try to see how deeply the chemical would leach. They only checked to see what would happen after one irrigation. Now after

twenty years of use, the chemical has evidently leached down hundreds of feet to contaminate ground water supplies.⁵¹ Other university scientists who have received grants from the manufacturers of DBCP have opposed the banning of it.⁵²

In the case of DBCP the University's relationship with industry has led to nonreporting of important results and a failure to thoroughly investigate questions of environmental contamination. The University acted more like a loyal friend of industry than a protector of public health. Information indicating the dangerous aspects of the chemical was available in 1961. More information concerning the likely extent of DBCP pollution became apparent during the 1960's, but university researchers continued to support its use.

The Council for Agricultural Science and Technology

There are several associations of industry supported scientists which appear to be neutral institutions dedicated to the task of transmitting scientific information to policy makers and the public in a balanced, fair manner, but which actually provide information which is biased toward the industry point of view. The most active

of these organizations is the Council for Agricultural Science and Technology (CAST) which was established in May, 1972. According to its president, CAST was organized to get scientific facts about food and agriculture to the government, the media, and the public as an aid to understanding and rational decision making.⁵³

The leadership of CAST describes it as a consortium of twenty-five scientific societies. These societies represent various agricultural sciences. Some of them include: the Weed Science Society of America, the Society of Nematologists, the Crop Science Society of America, the Soil Science Society of America, the Poultry Science Association, the American Dairy Science Association, the American Society for Horticultural Science, and the American Society of Agronomy. In addition to the societies, more than two hundred agribusiness corporations and industrial trade associations also belong.⁵⁴ There are also over three thousand individual members, three associate society members, and 120 subscriber members (libraries and information centers across the country).⁵⁵ CAST is based at Iowa State University in Ames and it is governed primarily by the societies which belong to it.⁵⁶

Support from industry. CAST receives substantial support from industry. The twenty-five scientific societies that belong pay annual dues of up to five thousand dollars depending on the number of their members who are in the agricultural sciences. Then there are the approximately 115 supporting members. These are agribusiness corporations which pay up to five thousand dollars per year based on the amount of sales of agricultural products. They are manufacturers of pesticides, herbicides, fertilizers, additives and other chemicals which are the subject of CAST reports. The supporting members include such companies as American Cyanamid, Dow Chemical, International Multifoods, Mobile Chemical Company, Ozark Fertilizer, and Stauffer Chemical Company.⁵⁷

There are about 125 sustaining members which are mostly agricultural trade associations. They pay annual dues of fifty dollars for regional groups and one hundred dollars for national groups. The sustaining members include such organizations as the American Meat Institute, the Potash Institute, the National Canners Association, and the National Pest Control Association. Another source of income for CAST is "grants-in aid" from such organizations as the National Agricultural Chemicals Association, Merck and Company, and Ralston

Purina. In 1978, the supporting and sustaining members and grants-in aid provided \$166,500 of CAST's \$292,500 operating budget, or almost 57 percent. The 25 scientific societies provided only \$36,000 or 12 percent. The remaining \$90,000 (31 percent of the total) came from individual members, bank interest and sales of a CAST directory of agricultural scientists. Industry support, however, is greater than the 57 percent figure just cited. There are industry sponsored projects and events staged to publicize CAST reports favorable to its point of view. For example Dow Chemical sponsored a press conference and Capitol Hill briefing on September 6, 1978 on CAST's phenoxy herbicide report which found Dow's product 2,4,5-T of no risk to humans. The National Agricultural Chemicals Association has sponsored at least five annual national food safety phone-ins. (The one held in 1977 cost NACA at least forty thousand dollars.) Another example is the production of a fifty second television newsclip sponsored by the Fertilizer Institute which featured a CAST scientist describing the risk to the earth's ozone layer presented by nitrogen fertilizers. Although sponsored by industry, these projects and events appeared in CAST's name, not in the name of the industrial sponsor.⁵⁸

CAST reports. CAST writes letters to editors and sends press releases to reporters around the country. Its main activity is the preparation of reports on controversial issues. These reports tend to deemphasize the possible dangers of using agricultural chemicals. CAST reports have defended the use of the herbicide 2,4,5T and other pesticides. One report criticized the EPA's basic assumptions used in banning pesticides. Some reports have favored the use of chemical fertilizer over microbial soil nutrients, and agricultural practices resulting in the presence of estrogens in feed have been defended.⁵⁹ CAST reports are not original scientific research. They are usually either a synthesis of facts about a current issue or a review of the scientific content of a public document. The reports are presented in the form of neutral views but they are biased toward the industry perspective with controversial issues presented as being concluded.⁶⁰

CAST reports are prepared by task forces whose chairmen and members are nominated by the Board of Directors and approved by the Executive Vice President. The task force members do not include scientific dissenters or persons known to have "extreme" views on an issue. James Witt, an agricultural chemist at

Oregon State University, has criticized CAST for its policy of systematically excluding dissenters from the scientific debate.⁶¹ Witt maintains that an extremist to CAST is "anything left of neutral."⁶² He argues that a balanced task force is the only way to circumvent individual prejudices and deter critics:

You have to put a few anti-pesticide spokesmen in there. That's what keeps you honest; that's the anvil the hammer beats against They can be there to rub your nose in some facts you've managed to ignore.⁶³

However Charles Black, who is the Executive Vice President of CAST and who must approve all task force members, disagrees. Black maintains that there is no need for "extremists."

They just cause trouble. They're unwilling to compromise, to listen, to allow as to how anyone but themselves can have a point of view.⁶⁴

Task forces lack not only dissenters, they lack members of important scientific disciplines related to the issues being studied. Toxicologists, biomedical researchers, and epidemiologists are missing from many task forces which deal with issues requiring human risk assessment. This leaves agronomists, plant pathologists, and animal scientists to make statements about human health which they may be poorly qualified to make. The result of this is that many CAST reports easily dismiss

problems which puzzle clinical researchers. An example of this is the question of whether or not there is a threshold or "no effect" level for carcinogens. Some researchers think that there may exist a level of exposure to a carcinogen so low that no cancer is caused. Others maintain that exposure to any amount may cause cancer. This controversial issue is presented in some CAST documents as if it were an established fact that a threshold level does exist.⁶⁵

Other questionable aspects of CAST reports include the speed with which they are completed (as short as six weeks) and the fact that they do not allow for the inclusion of a minority opinion as part of the final report. Furthermore, the reports are not noted for their accuracy or completeness.⁶⁶ Writing in the Bulletin of the Entomological Society of America, Witt commented on two CAST reports, one on aldrin-dieldrin and one on heptachlor/chlordane. (Aldrin/dieldrin and heptachlor/chlordane are two controversial pesticides most uses of which have been banned by the EPA.) The aldrin/dieldrin report, he says, is brief, consisting of nine pages. The extreme brevity of the document prevents a decent analysis. Only one reference is provided and the only data appears in the economic analysis section. The

critical question confronting the EPA in deciding whether to retain the registration of these chemicals was their impact on humans and wildlife, but the report does not consider the wildlife issue and the human health issue is dismissed in one sentence:

These residues pose a potential public health hazard, a discussion of which is beyond the scope of this report.⁶⁷

Witt describes the chlordane/heptachlor report as being better in quality but still having deficiencies. The arguments tend to run in one direction emphasizing the pro view and deemphasizing the con. Data favorable to the chemical is uncritically admitted while unfavorable data is exhaustively examined. Furthermore, the report fails to cite all relevant studies.⁶⁸

During a series of hearings on the use of diethylstilbestrol (DES) in cattle feed, the FDA criticized a CAST report on the subject which said that DES residues in meat were less harmful to humans than naturally occurring estrogens in wheat germ and green vegetables. The document was described as:

. . . a purportedly scientific document which in fact is a collection of conclusions by a number of cattle-oriented people followed by a list of disconnected references and appendices.⁶⁹

An FDA attorney referred to the report as, "a conclusion in search of citations."⁷⁰

Protest over antibiotics. In December 1978, six scientists resigned in protest from a CAST task force working on a report on the risks of feeding livestock large but less than therapeutic quantities of antibiotics in order to promote growth. The six signed a letter of protest which accused CAST of: omitting unfavorable evidence on the risks of drug use from a draft final report, emphasizing evidence on the benefits, and generally bending science to fit the public relations aims of the organization. All six of the scientists were microbiologists or biochemists. They were joined by a seventh, a microbiologist, who resigned in January 1979.⁷¹

The protesting scientists said that the final draft of the report contained numerous inaccuracies and was misleading. They said that CAST had misrepresented their statements which warned that the continued use of antibiotics can lead to the development of drug-resistant bacteria in livestock, some of which can produce disease in humans. Where the scientists had noted that a given antibiotic increases the resistance of the remaining organisms, it was reworded by the Council to indicate that it "might" have that effect. According to one of the scientists, Dr. Richard Novick, the Council

changed the whole tone of their work and softened the wordings. The final draft suggested that the wholesale use of antibiotic prophylactics is safe and beneficial, an implication which, according to Dr. Novick, is contrary to fully accepted standards of medical practice.⁷² In commenting on the research project Dr. Novick noted that the CAST format was "highly superficial" and that task force members prepared their reports in a "cursory and offhand manner."⁷³

Agricultural scientific support for CAST. One reason why it is important to look at CAST is the fact that although it is controversial, the support for it within the agricultural sciences is rather substantial. The list of twenty-five member societies, some of which have been mentioned, is impressive. The fact that these societies are members bestows on CAST reports a significant degree of legitimacy. A survey in 1979 (which, it should be stated, was conducted by CAST) of the deans and chief administrators of agriculture at the U.S. land grant colleges showed solid support of CAST.⁷⁴ For example one question asked if CAST should continue to respond to national news media on matters relating to food and agricultural science and technology in the

future as in the past. There were thirty three "yes" votes and one "no." A request to grade CAST on its past work produced:

16 votes	Excellent
14 votes	Good
2 votes	Fair
0 votes	Poor

All this indicates that support for CAST among the agricultural disciplines is rather substantial. The views expressed by CAST are obviously the views of many in the agricultural sciences. This suggests that the criticisms of CAST set forth by such scientists as Witt, Metcalf, Novick, and the other researchers who resigned over the antibiotics study are criticisms whose general content are applicable to much of agricultural science in general. The one-sidedness of CAST reports, their tendency to support the agribusiness point of view, and their lack of concern with environmental and public health problems are reflections of similar orientations within much of the agricultural sciences. CAST is important because it is not a marginal group on the periphery of the agricultural sciences, it is substantially supported and accepted.

Motivation

The descriptions of the Entomology profession, the University of California and CAST suggest strongly that there is a definite similarity in the points of view and policies supported by agribusiness and many in the agricultural sciences. Some indications of the financial relationship between these two sectors have been presented. The next step in reasoning might be to assume that agribusiness "buys" scientists. This conclusion has been made by many, but it appears to this writer to be too simple. Basically this is a question of motivation, one which the observer can only attempt to answer by observing patterns of action and making some sensible inductions concerning the probable reasoning beyond the observed actions. This is, at best, a speculative endeavor, but a bit of speculation fits in here.

It seems probable that some agricultural scientists who regularly support agribusiness views intentionally distort data and ignore reports of which they are aware. The great majority, however, seem to sincerely believe that they are being objective and fair. Their perspectives, however, do not usually seem to rise outside the immediate concerns of their own research and their

own disciplines. The primary concern of their disciplines is to increase agricultural productivity. Many of the concerns voiced by environmentalists, such as the effects of pesticides on ecological systems, involve many variables and require much testing in order to prove their validity beyond any doubt. Until such concerns are proven these scientists tend to dismiss them as not being worthy of much attention. Furthermore, they tend to differ with environmentalists concerning how much proof is needed.

In approaching the areas of environmental and health related science which are poorly understood, some subjective judgements concerning the meaning of data are needed. The subjective judgements of these scientists tend to place less emphasis on risks to humans or the environment and more on the need for agricultural productivity. Looked at this way the correlation between industry financial support for agricultural scientists and the views of many of those scientists favorable to agribusiness is not an indication that they are "bought." As in the laboratory audit system, the presence of agribusiness money seems to often favor the research (and thus careers) of those whose point of view is similar to that of industry. Industry money is

not likely to produce much support for research on the advantages of biological control or the possible damage to the environment which may result from the use of a pesticide.

Other Possibilities

This chapter has argued that ties based on financial support and philosophical perspective ensure a close relationship between industry and many in the agricultural research community. This relationship produces much information which has the effect of supporting the industry in its goal of maximizing profit rather than maximizing the amount of accurate, unbiased knowledge concerning the risks and benefits of pesticides.

The industry does not "buy" scientists. Instead it presents opportunities to do research related to the benefits of chemical pest control. In this way scientists who might have studied biological pest control or some of the adverse effects of pesticides instead study chemical control.

The example of DBCP shows how the economic relation of industry to much of the research in the agricultural

sciences encourages work which emphasizes the benefits of pesticides. This relationship offers little inducement for researchers to report possible adverse effects to regulatory agencies or to those segments of the public who may be affected.

The problems noted in this chapter might be alleviated by reforms of the relationship between industry and the universities. Universities could receive contributions from industry only under conditions which allowed the university to decide how money would be spent. All donations might be distributed among university researchers by a committee whose members were unaware of the identity of contributors. All donations would become part of a common fund, allocated to researchers on the basis of the merits of research proposals determined by such methods as peer review. Thus recipients of funds would not be under pressure to interpret results or structure research in ways conducive to the interests of industry in order to get more research funds. The inability to choose the types of research which it supported would most likely lead to a drop in industry support for research, but this loss could be replaced by increased government support. Thus support based on the pursuit of private interest would be replaced by support based

on the public interest.

We have been arguing that the industry mobilizes many of the resources of pesticide related science to its advantage. We have just dealt with a primary focus in this endeavor, the agricultural sciences. We will now deal with a second focus of this activity, the communication of information to the public and decision-makers concerning the possible carcinogenicity of pesticides.

NOTES TO CHAPTER VI

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- ³⁰Barnett, p. 16.
- ³¹Ibid., pp. 17-18.
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⁵⁴"CAST: Agriculture's Most Effective Spokesman," Farm Chemicals, October 1977, p. 26; Robin Marantz Henig, "CAST-Industry Tie Raises Credibility Concerns," Bioscience 29(January 1979): 9-10.

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⁵⁶The individual members have four representatives on the board of directors. Most of the other fifty-four directors are from the societies. Henig, p. 10; Eliot Marshall, "Scientists Quit Antibiotics Panel at CAST," Science 203(February 1979): 733.

⁵⁷Henig, pp. 9-10; "CAST: Agriculture's Most Effective Spokesman," p. 26. Much of this description of CAST is based on the following: Marshall; Henig; "CAST: Agriculture's Most Effective Spokesman;" Knight, "Proposed That The ESA;" and James M. Witt, "Proposed That The ESA Should Affiliate with CAST: The Contrary Argument," Bulletin of the Entomological Society of America 22(March 1976): 31-36.

⁵⁸Henig, pp. 9, 10; "CAST: Agriculture's Most Effective Spokesman," p. 26.

⁵⁹Henig, p. 59; Knight, "Entomological Potpourri," p. 5; Bayard Webster, "Agricultural Council Questions EPA Ban on Several Pesticides," New York Times, 21 January 1976, p. 11; Bayard Webster, "6 Scientists Quit Panel In Dispute Over Livestock Drugs," New York Times, 23 January 1979, p. C2.

⁶⁰Henig, pp. 9, 12; Marshall, p. 732.

⁶¹Henig, pp. 11-12; Walsh, pp. 659, 661.

⁶²Henig, p. 11.

⁶³Ibid.

⁶⁴Ibid., p. 12.

⁶⁵Ibid.

⁶⁶Ibid., p. 11; Walsh, p. 661; Knight, "Entomological Potpourri."

⁶⁷Witt, p. 35.

⁶⁸Ibid., pp. 34, 35.

⁶⁹Henig, p. 12.

⁷⁰Ibid.

⁷¹Henig, p. 12; Marshall, pp. 732-733; Elizabeth Wehr, "Congress Plans Major Review of Food Laws," Congressional Quarterly, 10 February 1979, pp. 230-236; and Marian Burros, "The CAST Controversy: Impartial Scientific Research Group or Industry Advocate," The Washington Post, 8 March 1979, p. 31.

⁷²Marshall, pp. 732-733; Webster, "Six Scientists Quit," p. C2; and Richard Novick, "Letter to the Editor," Bioscience 29 (May 1979): 277-278.

⁷³Novick, p. 278.

⁷⁴"CAST: Agriculture's Most Effective Spokesman," p. 30.

CHAPTER VII

WHOSE VIEW OF CANCER?

The ability of industry to mobilize the information generating resources of science to its advantage is not restricted to the agricultural sciences. One of the most controversial questions related to the regulation of pesticides is their possible carcinogenicity. This subject is very important because many pesticides are suspected of being carcinogenic and whether or not they are is frequently debated. In the discussions surrounding pesticides the question of carcinogenicity is one of the most frequently debated topics. The question of what scientific evidence constitutes acceptable proof of carcinogenicity is strongly debated within the scientific community. This is true not only of pesticides but also of other chemicals. In communicating with members of Congress and the public, industry supports that side of the scientific debate which is most compatible with its interest in being regulated less. Because the environmentalists are not able to

match the resources of industry in communicating with congressmen, congressional committees, and the public, the view of carcinogenicity to which many congressmen and members of the public are exposed is one which is more favorable to industry. Thus legislators and the public often tend to have a view of cancer and its causes which, many would argue, does not adequately allow for the protection of human health. Some scientists question the sincerity of those who support the industry's view of what constitutes acceptable evidence of carcinogenicity. One very well known researcher even refers to several industry supported theories as "myths."¹ This discussion will not criticize the validity of the industry supported theories. It will only point out that there exists a diversity of views on carcinogenicity, that there are a substantial number of reputable scientists who disagree with industry theories and who support different theories of which the public and legislators are often unaware. If the public and legislators were more aware of these theories it is probable that more substances would be considered to be carcinogenic and it is logical to assume that demands for more stringent regulation would rise. In order to explain these alternative theories, and the

scientific disputes concerning cancer theory it is necessary to take a fairly extensive look at how substances are tested for carcinogenicity.

How Testing Is Done

The primary ways in which chemicals are tested in order to determine their carcinogenicity are through laboratory tests and epidemiological analysis. Epidemiologists study human populations in order to link the incidence of cancer with causal factors. Some epidemiological studies focus on a particular factory or factories in order to determine the effect of chemicals to which workers are exposed. Others look at larger population groups, such as one study which compared rural and urban populations in an attempt to correlate increased incidence of cancer with pesticide use.² All epidemiological studies are very difficult to conduct. Particular problems encountered in studying factory workers include the long latent period of cancer, and the difficulty of following up workers who leave their factory jobs. Cancer often does not appear for twenty-five to thirty years after exposure to a carcinogen.³ In addition many workers leave their jobs and go on to

new ones. It is often difficult to find workers who worked in a factory as long as twenty-five to thirty years ago. These problems are especially significant if the carcinogen being studied is comparatively weak, that is, if it tends to cause cancer in fewer cases than other carcinogens do. The weaker the carcinogen is, the more workers will be needed in order to have a sample large enough to provide statistically significant evidence that detected cancers are caused by the substance in question.

Epidemiologists often study large populations. In studying large populations the long latent period of cancer just discussed is also a problem as is the mobility of the population. There is also the problem of controls. In order to determine that a suspected chemical causes cancer there must be a comparison of an exposed group to a "control" group which is not exposed in order to see if there is an unusually high number of cancers in the exposed group. With many pesticide chemicals it is often difficult to find a group which is not exposed. For example when DDT was in widespread use, most people in the United States had some residue of this chemical in their bodies. Another problem is that the public is exposed to so many environmental

influences that it is often difficult to be certain that the cause of cancer is the suspected chemical and not some other etiologic factor such as age, smoking, or another carcinogenic substance.⁴

Thus it is very difficult to conduct epidemiological analyses and it is not surprising that relatively few adequate studies have been done for chemical carcinogens.⁵ This is particularly true concerning pesticides.⁶

Given the problems associated with epidemiological analysis, most testing for carcinogenicity occurs in the laboratory. Laboratory studies range from DNA modification experiments to mutagenesis studies on cells in culture, to life time animal feeding studies.⁷ The most reliable and acceptable laboratory tests are those involving animals. While other tests are useful indicators of carcinogenicity, they are not yet ready to replace animal tests.⁸

In animal tests, a group of animals are systematically exposed to various amounts of a suspected chemical under tightly controlled laboratory conditions. The effects of the chemical can be determined by comparing this group with a control group of animals who (except for the chemical being studied) have been subjected to

exactly the same environmental conditions as the first group. The determination that the tested chemical is carcinogenic depends on the detection of a statistically significant excess of tumors in the experimental group as compared to the control group.⁹ Tests are normally performed on at least two animal species in determining the carcinogenicity of a questioned substance.¹⁰ The species used are usually rats and mice, although other species are also sometimes used. Because of the expense, tests generally do not include more than two hundred animals and often the number is less.¹¹ Animal testing is quite expensive and time consuming. A thorough test costs \$250,000 per chemical and takes about three years to complete and analyze.¹²

Testing Controversies

There are several aspects of animal testing which are warmly debated by scientists. In examining the controversy over what constitutes acceptable proof of carcinogenicity we will look at four of them.

1. The applicability of animal tests to human beings
2. The size of test doses

3. The existence of a threshold level of exposure to a chemical below which the chemical is safe
4. Whether or not benign tumors should be distinguished from malignant ones in determining carcinogenicity.

Animal testing. Scientists differ in the amount of weight they are willing to assign to animal tests as an indicator of carcinogenicity. Some tend to deemphasize the importance of these tests. They repeatedly stress the point that an indication that a substance causes cancer in mice does not mean that the same substance will cause cancer in humans.¹³ A paper on the causes of cancer presents the view of a large chemical manufacturer:

Substances that produce benign or malignant tumors in animals, on the other hand, are only a potential cancer risk for humans since not all animal carcinogens have been proved to cause cancer in humans. In some cases, human experience with a substance may indicate that the potential for cancer is very low.¹⁴

Other researchers interpret tests which demonstrate the carcinogenic effect of a substance on animals as very strong evidence that it is likely to be carcinogenic in humans. While maintaining that there can be no absolute assurance that a chemical found to be carcino-

genic to animals will also cause cancer in humans, they point out that all of experimental biology and medicine assumes that effects in animals, properly qualified, are applicable to man.¹⁵ They argue that cancer in humans and animals is strikingly similar and that virtually every form of human cancer has an experimental counterpart.¹⁶ According to Dr. Epstein:

However there is now overwhelming agreement by most qualified scientists that if a chemical causes cancer in well-designed animal tests, then there is a strong likelihood that it will also cause cancer in exposed humans.¹⁷

Epstein maintains that extrapolation of animal test results to humans is fundamental to cancer research and that:

This inference rests on over half a century of intensive scientific investigation into the biology and chemistry of carcinogenesis and carcinogens in many organisms, including humans. Acceptance of the extrapolation principle is grounded in the fact that fundamental life processes in mammalian and other animals are basically the same as those in humans.¹⁸

A fairly recent report of a committee of the National Academy of Sciences concluded that:

The opinion is widely held that if a substance is demonstrated to be a carcinogen for any mammalian species in an appropriately designed and performed carcinogenesis bioassay then the substance is likely to pose a potential cancer risk to humans.¹⁹

Scientists supporting the importance of animal tests often point out that of the approximately twenty-five

chemicals known to cause cancer in man, all but two (benzene and arsenic) have been shown to cause cancer in rodents.²⁰

Dosage. One of the most often heard criticisms of animal tests is that the doses to which the animals are exposed far exceeds that to which humans are normally exposed. Those supporting animal tests argue that high doses are necessary because of shorter exposure times and the limited number of animals used. While humans may be exposed to a chemical for thirty years or more, animal life spans are much shorter and animal tests last for only about two years.²¹ The amount of animals used in a laboratory experiment is very small in contrast to the human population which may be exposed to the substance being studied. Using a small amount of animals makes it difficult to detect the effects of a weak carcinogen. For example if a low level of exposure to a carcinogen caused cancer in an exposed human population at a rate of 0.01 percent, then one thousand people in a total population of ten million would develop cancer. In order to directly detect this low an incidence in the laboratory would require hundreds of thousands of animals at an astronomical cost. Thus

in order to increase the incidence of cancer and reduce the amount of time necessary for it to develop, researchers expose test animals to high doses of chemicals and then use biologically reasonable models in extrapolating the results to estimate risks at low doses.²² In doing this, scientists assume that if the substance being tested is not carcinogenic, exposure to high amounts of it will not cause cancer.

Thresholds. Some researchers claim that there exists a "threshold" level of exposure to a chemical below which the substance has no carcinogenic effect.²³ Thus, for example, a substance which caused cancer when people were exposed to it at concentrations of twenty-five ppm or higher, might be harmless at lower concentrations. If this assumption is valid, then regulations concerning the substance need not ban it. It would only be necessary to ensure that public exposure was below the threshold level.

Others suggest that there is insufficient evidence to support the concept of a threshold level.²⁴ One critic of thresholds suggests that even if it is postulated that they exist, there is presently no empirical or theoretical basis for determining the dose at which

they may occur.²⁵ If thresholds do not exist then complete protection of the public from the effects of a carcinogenic chemical would require that there be no exposure at all.

Benign tumors. At the end of an animal experiment, the animals are killed and autopsied in order to determine whether or not the tested chemical has caused cancer. At this time benign tumors are often found. Many scientists argue that benign tumors should be considered equally with malignant ones as indications of carcinogenicity.²⁶ This argument is based on the opinion that many tumors frequently develop into cancers at a later stage.²⁷ Other scientists are critical of this assumption.²⁸

Promoting A Point of View

The industry perception of carcinogenicity is frequently conveyed to the public. When a regulatory agency announces that a substance has been found to be carcinogenic or when an allegedly carcinogenic substance is discussed in the media, the frequent industry reply is that the evidence is insufficient. For example in a

newspaper article about ethylenebisdithiocarbamate (EBDC), a pesticide chemical which has been shown to cause thyroid tumors and birth defects in rats and liver tumors in mice, an industry spokesman is quoted as follows:

We wish to emphasize to our knowledge there is no information in the world that shows that EBDC fungicides, or ethylenethiourea, are suspected of causing any tumors, birth defects, mutations, or thyroid defects in humans. To say that these chemicals are suspected of these problems is totally without any scientific evidence.²⁹

This statement is fairly typical of those made by industry to the press.³⁰ The "no information" to which the spokesman refers is epidemiological evidence. In its public statements on pesticides and other chemicals industry often takes the stand that animal tests indicating carcinogenicity are insufficient proof.³¹ Animal tests must be accompanied by epidemiological evidence. However the previously described problems of conducting epidemiological analyses make it very difficult to establish such a link. In this way industry applies its view of carcinogenicity to public statements which has the effect of indicating that a concern raised by a regulatory agency or environmentalists is not serious. In confronting the possible carcinogenicity of a chemical which many scientists believe should be stringently

regulated, the typical industry approach is to set forth any one or combination of the several theoretical explanations of carcinogenicity which it supports. A suspected chemical was given to animals in higher doses than humans would ever encounter; many of the tumors found were benign; humans would not be exposed to the substance in amounts above a threshold level which the evidence indicates is a safe level of exposure. The public is usually confused because often neither industry or environmentalists caution that their explanations of carcinogenicity are theoretical assumptions rather than established scientific facts.

Thus an essential element of the politics of pesticide regulation (and toxic substance regulation in general) is the manipulation of meaning concerning the carcinogenicity of chemicals. The industry view of what constitutes adequate evidence of carcinogenicity is one which is strongly criticized by many scientists, but this view is often presented to the public, congressmen, state and federal regulators and farmers. Often the manner in which it is presented gives the reader little evidence that it is a theoretical assumption rather than a scientific fact. Thus an ideology of cancer causation is promulgated and reinforced by industry.

This probably accounts for the strong opposition of most farmers to stringent pesticide regulation and their general lack of concern for the effects of pesticides.³² This subject will be discussed later. Suffice it to say here that there is strong evidence to support the assumption that most farmers receive the greatest part of their information about pesticides from pesticide salesmen.³³ This source of information and the generally strong support for industry in the farm magazines tend to reinforce the industry ideology.

Policy makers and scientific controversies. Many authors have pointed out the need for policy makers to distinguish between scientific facts and political values.³⁴ It is argued that in confronting a policy issue involving science the policy maker should ask the scientist what the scientific facts are and what is unknown. Understanding the facts, the policy maker can then make decisions based on these facts and on political value choices. This approach makes sense; however in applying it, it is often not recognized that in communicating with policy makers and the public, scientists are often very unclear about what is known and what is not known. Often statements are made as if they were

facts when in reality the theoretical bases supporting these statements are the subject of substantial disagreement.³⁵ Thus the policy maker who will be making choices related to the regulation of carcinogens and who would like to understand what is known and not known about chemical carcinogenicity will not find a clear known/unknown line, nor will he be able to easily discern the political value choices open to him. The boundary between scientific fact and political value choices is amorphous and unclear. Discerning it requires substantial communication with scientists and at least some knowledge of the theoretical controversies which exist in the scientific community. The problem of thresholds provides an example.

Because they are related to the making of choices which will involve the welfare of many people, scientists will confront the unknowns of pesticide carcinogenicity testing at least somewhat on the basis of their personal values. The threshold theory illustrates the influence of values in choosing a scientific theory. To review what has been said about thresholds, according to this theory there is a level of exposure to a carcinogenic chemical below which the substance will not cause cancer and above which it may. This level might be

different for different chemicals. It might be five ppm for chemical A, ten ppm for chemical B, etc. The policy implications of this theory are important. If a threshold level exists, then the public can be completely protected by legislation limiting the amount of exposure to an amount below the threshold. If a threshold does not exist, then complete protection will require legislation which prohibits any exposure of the public at all. The scientist who supports or denies the existence of thresholds does so on the basis of scientific knowledge, but also, most probably, at least somewhat, on the basis of his personal philosophy. There exists data and theoretical explanations of this data which tend to indicate that thresholds exist.³⁶ There also exists data and theoretical explanations which tend to disprove the threshold theory.³⁷ The scientist attempting to discern the answer to this scientific question finds an incomplete explanation offered by the scientific evidence. Thus in confronting this area of uncertainty personal value choices are likely to be an important variable. An examination of the literature surrounding this scientific question indicates that scientists are often fairly strong in voicing their support or criticism of this theory.³⁸ Given the

inconclusiveness of the data, this strength of support must be based at least somewhat on values. It is logical to assume that the researcher whose personal priority of choices tends to emphasize such goals as the prevention of cancer and the avoidance of risks in confronting environmental problems may tend to criticize the threshold theory, or at least to assume that it should not be accepted until proven. The researcher who is concerned most highly with such values as the need for productivity may tend to support the threshold theory, or at least to assume that it should be supported until disproved.

The policy maker who has at least some understanding of the existence and nature of the debate over thresholds is less likely to uncritically accept the assertions of scientists on one side or the other of this controversy, assertions which are often stated so forcefully that they seem to be statements of fact rather than theoretical assumptions. In their many statements on the scientific aspects of pesticide regulation in hearings, the Congressional Record, and in personal interviews, most legislators do not seem to have much knowledge of the theoretical controversy over thresholds or of other pesticide related scientific controversies.

A communication advantage. As has been pointed out, the industry view of carcinogenicity is frequently communicated to the public through the press and to congressmen in congressional testimony.³⁹ We have described already the tendency of industry witnesses to outnumber environmentalists at hearings. Furthermore interviews with several congressmen, aides, and Agriculture committee staff members indicate that while they do not frequently talk to the environmentalists they often see industry people. The lack of contact with environmentalists is not, they say, because they are unwelcome, but because the environmental groups do not often attempt to make contact. When questioned about this, the environmentalists replied that they do not have enough people to communicate more frequently with the legislators.

The EPA does support a view of chemical carcinogenicity testing which is generally consistent with the environmentalists' perspective. In its communication with Congress it occasionally attempts to explain this perspective and thus offers an alternative explanation to that of industry. However given the number of industry witnesses at hearings, and the frequency of industry contacts with congressmen the opportunities for industry to convey its interpretation of this

scientific issue are considerable. Because of their less substantial resources, the environmentalists can not muster anywhere near the number of industry witnesses or lobbyists in order to present their perspectives. When we also consider the frequency with which the industry perspective is reported in the press, the pro-industry attitude of the farm magazines, and the influence of the pesticide salesmen, the evidence appears to indicate that the industry exerts substantially more influence than the environmentalists in communicating its scientific perspective to the public, pesticide users, and legislators. Science is the legitimatizing foundation of pesticide regulation. All participants constantly use the language of science in supporting their preferences. Those who are most able to support research and communicate their theoretical interpretations of data enjoy a substantial advantage.

Communicating with farmers. While the attitudes of the public about pesticides are important, the opinions of farmers are particularly important. Most people are exposed to pesticides only in relatively small amounts such as a residue on foods. Farmers use pesticides frequently and are thus more susceptible to possible

adverse effects. A strong desire on the part of farmers and farm organizations for stringent regulation in order to protect their health and the long term productivity of their farms would be a powerful political force; however, as has been pointed out, farmers tend to have very positive attitudes toward the use of pesticides and tend to be unconcerned with the possible negative consequences of their use.⁴⁰ The numerous farm groups appearing at congressional hearings regularly testify in support of less stringent forms of regulation. Given the possible adverse effects of pesticides on their health it seems important to look more closely at why this important group is not more concerned with the potential dangers of pesticides.

A study done for the Council on Environmental Quality and the EPA in Iowa and Illinois in 1973 measured farmers' reasons for using pesticides, their knowledge of alternate crop protection methods, and their sources of information on both chemical and nonchemical crop protection.⁴¹ The report found that farmers receive their information about pesticides primarily from pesticide sellers, labels (on pesticide containers), and other farmers. Of these three, pesticide sellers were the most popular source of

information. The report pointed out that university extension specialists, area extension agents, and county agents (farm advisors) were regarded by the growers as very useful sources considering their small numbers in relation to the large number of farmers they serve. However, the report continued, the public servants are outnumbered by pesticide industry representatives and pesticide sellers by wide margins and their messages reach only a small percentage of farmers directly.

The report notes that messages recommending reduced or no use of pesticides, " . . . do not flow well through this system."⁴² The reason that this is a situation in need of correction can be seen in the report's warning that there is increasing evidence that in the long run, only those crop production strategies that are ecologically sound will also be economically sound. It warns that the fact that current crop protection decisions may entail hidden future costs is generally not known to farmers and no effort is being made to bring it to their attention.

Van den Bosch points out the importance of another significant flow of pesticide information, the agricultural magazines. The agricultural press is,

according to van den Bosch, heavily dependent on the chemical industry for revenue and it presents a one-sided story regarding pesticides.⁴³ Examination of issues of several agricultural magazines supports this observation. The pesticide manufacturers advertise heavily in these publications.

Concepts and regulation. This chapter has described several theoretical disputes concerning how chemicals cause cancer. These disputes are not merely academic controversies among scientists. The ways in which the public and decision makers look at carcinogenicity will have a strong effect on the types of regulatory legislation demanded. The industry utilizes its superior resources in order to communicate its view of carcinogenicity to decision makers, the public, and farm users. Often this view is presented as if it were a matter of established scientific fact rather than a possible explanation. Policy makers wishing to deal effectively with this issue will have to acquire at least some knowledge of the basic theoretical controversies related to it.

NOTES TO CHAPTER VII

¹Samuel S. Epstein, "Constraints In Decision-Making," in Annals New York Academy of Sciences, vol. 329: Public Control of Environmental Health Hazards, eds. E. Cuyler Hammond and Irving Selikoff (New York: New York Academy of Sciences, 1979), p. 312.

²Larry C. Clark et al, "Cancer Mortality and Agricultural Pesticide Use In the Southeastern United States," paper for presentation at the 8th International Scientific Meeting of the International Epidemiological Association, San Juan, Puerto Rico, 17-23 September 1977.

³Marvin A. Schneiderman and Charles C. Brown, "Estimating Cancer Risk To A Population," Environmental Health Perspectives 22(February 1978): 115; William F. Durham and Clara H. Williams, "Mutagenic, Teratogenic and Carcinogenic Properties of Pesticides," Annual Review of Entomology 17(1972): 143. For some of the problems in conducting epidemiological studies see Schneiderman and Brown, and Durham and Williams, and also Bruce N. Ames, "Identifying Environmental Chemicals Causing Mutations and Cancer," Science 204(May 1979): 587; and National Academy of Sciences, Regulating Pesticides, (Washington, D.C.: National Academy of Sciences, 1980), p. 249.

⁴Arthur H. Wolff and Frederick W. Oehme, "Carcinogenic Chemicals In Food As An Environmental Health Issue," Journal of the American Veterinary Medical Association, 164(March 15, 1974): 624.

⁵Melvin D. Reuber, "Carcinogenicity Testing of Chemicals With Particular Reference to Organochlorine Pesticides," The Science of the Total Environment 10(1978): 112.

⁶National Academy of Sciences, Regulating Pesticides, p. 239; National Academy of Sciences, Analytical Studies For the U.S. Environmental Protection Agency. vol. 7: Pesticide Decision Making (Washington, D.C.: National Academy of Sciences, 1978), p. 239.

⁷Schneiderman, p. 115.

⁸Wil Lepkowski, "Extrapolation of Carcinogenesis Data," Environmental Health Perspectives 22(February 1978): 174; and D. R. Calkins et al, "Identification, Characterization, and Control of Potential Human Carcinogens: A Framework For Federal Decision-Making" Journal of the National Cancer Institute 64(January 1980): 172.

⁹National Academy of Sciences, Regulating Pesticides, p. 240.

¹⁰H. F. Kraybill and Myron A. Mehlman, eds. Advances In Modern Toxicology vol. 3: Environmental Cancer (Washington, D.C.: Hemisphere Publishing Company, 1977), p. 113.

¹¹National Academy of Sciences, Regulating Pesticides, p. 244.

¹²Ames, p. 588; "Is A Single Cancer Test Policy Feasible?" Chemical Week, 13 July 1977, p. 49.

¹³For an indication of this perspective see "Is A Single Cancer Test," p. 50; Bayard Webster, "Agricultural Council Questions EPA Ban On Several Pesticides," New York Times, 21 January 1976, p. 11; and H. F. Kraybill, "Pesticide Toxicity and Potential For Cancer: A Proper Perspective," Pest Control, December 1975, pp. 11, 13.

¹⁴"The Cancer Problem In Perspective," Ecolibrium, Fall 1978, p. 4.

¹⁵Schneiderman, p. 116; and Reuber, p. 59.

¹⁶Schneiderman, p. 116.

¹⁷Samuel S. Epstein, The Politics of Cancer (San Francisco: Sierra Club Books, 1978), p. 65.

- 18 Epstein, The Politics of Cancer, p. 57.
- 19 National Academy of Sciences, Regulating Pesticides, pp. 239-240.
- 20 Calkins, p. 8; "Cancer Risk," EPA Journal 5 (March 1979): 10; and Luther J. Carter, "How To Assess Cancer Risks," Science 204 (May 25, 1979): 811-816.
- 21 "Cancer Risk," p. 8; and Wolff, p. 624.
- 22 Schneiderman, p. 117.
- 23 For arguments supporting the threshold theory see: Durham, pp. 123, 143; "Is A Single Cancer Test," p. 50; Kraybill, "Pesticide Toxicity"; Perry Gehring, "The Risk Equation: The Threshold Controversy," New Scientist 75 (August 18, 1977): 426-428; and Hans L. Falk, "Biologic Evidence For The Existence of Thresholds In Chemical Carcinogenesis," Environmental Health Perspectives 22 (February 1978): 167-170.
- 24 For arguments against the existence of thresholds see: Lepowski, pp. 177-178, 181; and N. Kim Hooper, Robert H. Harris and Bruce N. Ames, "Chemical Carcinogens," Science 203 (February 16, 1979): 602-603.
- 25 Lepkowski, pp. 177-178.
- 26 "Cancer Risk," p. 29; and Wolff, p. 633.
- 27 Webster.
- 28 Webster; Council For Agricultural Science and Technology, "The Environmental Protection Agency's Nine Principles of Carcinogenicity," Council For Agricultural Science and Technology Report No. 54, January 1976, p. 4.
- 29 Bev Eaton, "Chemical Air-Show," Valley Advocate, 24 September 1980, p. 22.

³⁰ For some examples of press coverage of industry views of carcinogenicity testing of pesticides see: Eaton; Jane Brody, "Gasoline Additive Called Cancer Risk," New York Times, 14 November 1978, pp. 1, 15; "The Dieldrin Dilemma," Time, 2 September 1974, pp. 68-69; "The EPA Bans 2 Pesticides Suspected of Cancer Link," New York Times, 31 July 1975, p. 34; "Virginia Plant Shut, 28 Hospitalized In Pesticide Case," New York Times, 14 December 1975, p. 47; and "How Hercules Is Rebutting RPAR on Toxaphene," Farm Chemicals, August 1977, pp. 20, 21. For some examples of industry views, as reported in the press, about the standards for carcinogenicity testing of other chemicals see: "Indoor Pollution," Time, 8 December 1980, p. 126; Cynthia Jabs, "Chloroform Linked To Cancer, Fading Out," New York Times, 20 June 1973, p. F3; Karen DeWitt, "Industry Group Cautious Against Foam Insulation Ban," New York Times, 6 December 1980, p. 8; Jane E. Brody, "Cancer Link To Hair Dye Feared," New York Times, 15 December 1977, pp. 1, D13.

³¹ For examples of industry views of carcinogenicity see the articles referred to in the previous footnote.

³² The lack of concern on the part of farmers about pesticides has been shown by Holscher. Louis M. Holscher, The Attitudes of Farmers Toward Pesticides As A Social Problem, Ph.D. Dissertation, Washington State University, 1975 (Ann Arbor, Michigan: Xerox University Microfilms, 1975).

³³ U.S., Environmental Protection Agency, Farmers' Pesticide Use Decisions And Attitudes on Alternate Crop Protection Methods, 1974, p. 109.

³⁴ For example author Don K. Price points out that scientists are led by confidence in their special scientific techniques to try to make judgements on political values, and he warns that administrators and politicians should note the aspects of problems on which scientists and professionals are making judgements not required by the nature of their subject matter. Don K. Price, The Scientific Estate, (Cambridge: The Belknap Press, 1965), pp. 140, 144.

³⁵For example the previously quoted statement about EBDC gives the impression that it is a fact that there is no scientific evidence showing that EBDC is carcinogenic "to humans." Some scientists would say that an indication of carcinogenicity in animal tests is evidence that a chemical is carcinogenic to humans or suspected of being so.

³⁶For examples of such explanations see: Gehring; and Falk.

³⁷For examples of such explanations see: Lepkowski, pp. 177, 178; and Hooper.

³⁸For example see: U.S., Congress, House, Subcommittee on Oversight and Investigations of the Committee on Interstate and Foreign Commerce, Environmental Causes of Cancer, Hearings. 94th Cong., 2d sess., 1976, pp. 318-319.

³⁹Some examples of testimony to Congress are: U.S., Congress, House, Committee on Agriculture, Federal Insecticide, Fungicide, and Rodenticide Act Extension, Hearings. 94th Cong., 1st sess., 1975, pp. 373, 382; U.S., Congress, House, Committee on Agriculture, Federal Insecticide, Fungicide, and Rodenticide Act, Hearings. 95th Cong., 1st sess., 1977, p. 179; U.S., Congress, House, Subcommittee on Oversight and Investigations of the Committee on Interstate and Foreign Commerce, Environmental Causes of Cancer, Hearings. 94th Cong., 2d sess., 1976, pp. 86, 318-319; and U.S., Congress, Senate, Subcommittee on Agricultural Research and General Legislation of the Committee on Agriculture and Forestry, Extension of the Federal Insecticide, Fungicide, and Rodenticide Act, Hearing. 94th Cong., 1st sess., 1975, pp. 57, 69.

⁴⁰Holscher.

⁴¹U.S., Environmental Protection Agency, Farmers' Pesticide Use Decisions.

⁴²*Ibid.*, p. 6.

⁴³van den Bosch, pp. 131-132.

CHAPTER VIII

SOME FINAL CONSIDERATIONS

Many would argue that the pesticide problem was the first of the environmental issues to emerge in the late 1960's, the issue which contributed more than any other to public awareness of the concepts and problems of ecology. Because policymakers have had a longer amount of time to deal with this issue, than say air or water pollution, one might assume that greater progress would have been made. This however is not the case. The aspirations embodied in the 1972 FIFRA have not been met and subsequent revisions of that already weak legislation have weakened it further. Weak legislation and less than vigorous enforcement by the EPA have meant that our criteria for adequate regulation discussed in Chapter II have not been met. In this chapter we will first discuss these criteria. We will then summarize the reasons why the political system has produced less than adequate policy outputs. In doing this the findings of this research will be compared to the ideas of political theorists concerning

how legislators make policy. This will be followed by a brief examination of some long term causal variables related to this policy issue. Finally, there will be a short discussion of some potential solutions to the pesticide problem and their political feasibility.

Examining the Criteria

In Chapter II we described several criteria for the regulation of pesticides. These were:

1. A strong basic law regulating pesticides
2. Effective enforcement of pesticide regulatory legislation free from arbitrary interference by Congress
3. The production of accurate, objective, scientific data concerning the effects of pesticides on human health, wildlife and the total environment
4. The implementation of legal requirements which would facilitate the increased use of Integrated Pest Management techniques.

The preceding pages have shown how these criteria have not been met. Let us now look at each one.

The pesticide law. An adequate pesticide law should protect human health and the environment from the adverse effects of pesticides while at the same time taking into consideration the farmer's need to avoid large crop losses and the importance of pest control to public health. Thus the law should allow for the use of pesticides when necessary, but should promote the use of more environmentally sound means of pest control whenever possible. Pesticide users should be educated about the potential adverse effects of these products and about more biologically sound IPM alternative technologies.

Against these criteria the law, generally, has been found to be deficient. The 1972 law did provide the basis for more protection than the statute which it replaced, however it contained significant weaknesses such as its excessive procedural requirements, its provisions for indemnity and for state enforcement, and its failure to adequately address such needs as the training of applicators, the initiation of citizen's suits, and the reduction of the overall amounts of pesticides used. In subsequent years changes to the law, such as the provisions for self-certification of applicators, conditional registration, and the

assignment of primary enforcement responsibility to the states, have tended to directly weaken it. Many other changes have weakened it by making it more difficult to administer.

The framers of the law have provided language which appears to be aimed at balancing the need to protect human health and the environment from the adverse effects of pesticides on the one hand, against the need of farmers for a reasonable profit and the need to protect public health from diseases caused by insects on the other. The specific phrase in the law which refers to this need is "unreasonable adverse effects." The Administrator of the EPA is supposed to make his decisions about whether or not to register pesticides on the basis of this criterion. The problem with this standard is that its meaning is always subject to debate and differing interpretations. In practice, due primarily to the pressure exerted by Congress on the EPA, this phrase has usually been interpreted in a manner compatible with the interests of farmers and the industry.

The focus of FIFRA has been almost exclusively on the registration of pesticides. There has been very little effort aimed at reducing the overall use of

pesticides or at educating the public about IPM alternative pest control technologies. There has also been very little education of the consumer about the effects of pesticides, such as the harmful effect of residues on food. The public generally prefers unblemished food and a very low level of insect parts in food and is generally unaware that the cost of such cosmetically appealing food may be a significant amount of danger from exposure to higher than needed pesticide residues.

Enforcing FIFRA. The law is very difficult to enforce because of its many procedural requirements and because the Congress tends to interfere with EPA efforts at substantial enforcement. There are many more procedural requirements than are necessary for the fair treatment of those regulated. As originally written in 1972, the law contained an excessive amount of procedures and subsequent revisions have added more unnecessary requirements. These revisions have most often been justified as ways to make the law more "rational." As an effective means of protecting the public and environment they have actually tended to make it less rational. To the extent that the EPA has been able to

cope with the procedural labyrinth imposed on it by Congress, it must still face congressional interference of the kind seen in the examples of the tussock moth and the pesticide hotline.

FIFRA is not a strong law and both its structure and congressional interference prevent rigorous enforcement; however the considerable amount of attention given to this legislation by environmentalists, legislators and industry people suggest that there must be a causal factor which explains its importance. This factor appears to be its symbolic value. The preceding pages have shown how the law fails to protect the environment; however on first reading it appears to be a carefully drawn document aimed at environmental protection. It is lengthy and complicated suggesting an attempt to reach the socially optimal outcome in every situation which might fall under its jurisdiction. The language of the law and the language surrounding its revisions and implementation, especially the language of its legislative history, suggests a sincere effort to reach a balance between the needs of the environment and such other needs as the protection of crops, which is in the best interest of all concerned. In this regard the use of risk-benefit analysis is

particularly impressive. This tool is used in making registration decisions and in many studies related to the revision and implementation of the law. It is a procedure which seems to present to many members of the public the impression of being a much more objective means of decision-making than many who are closely involved with the use of this tool consider it to be.

Only after careful examination do certain aspects of the law and its revision become apparent. Without careful study it is difficult to see what ideas, such as the implementing of IPM, have been consistently ignored and what information, such as the many GAO and other reports previously described, has also been ignored. It is also difficult to see the bias in the reporting of scientific information related to pesticide regulation which the law facilitates. Most members of the public lack the time to study the pesticide issue to the extent necessary to discern these factors. Furthermore even many of the everyday participants in this policy process, caught up in the practical demands of preparing testimony, or advocating or opposing the registration of a particular chemical, apparently lose sight of many of these problems.

Thus impressive language and procedures tend, to a significant degree, to obscure the reality of an excessively complicated law, loopholes in the law (such as conditional registration) and the interference of Congress with enforcement. The law in its symbolic context becomes different things to different policy participants. To the public it is evidence that pesticides are being regulated in a reasonable manner. To the legislator it is an accomplishment to which, when communicating with constituents, he can refer as an indication that he has taken action to protect the environment or, if the constituents are primarily farmers, to ensure that they have an adequate supply of different pesticides available. To the industry it is a document which answers the public's demands for protection of the environment while providing relatively little regulation. This does not mean that the industry is satisfied with FIFRA. Industry often supports legislation which will weaken the law further, but generally there seems to be in the business community a realization that some regulation is necessary. It is realized that no regulation or extremely weak regulation would soon be followed by demands for legislation and possibly a high degree of regulation.

For the environmentalists the law seems to be evidence that their efforts matter. Their efforts do matter for, as has been said, FIFRA does provide some protection and some of the most dangerous products have been removed from commerce or had their uses severely restricted. However in the interviews conducted with them, at least some of the environmentalists provide the impression that they believe they have accomplished more than this evaluation of FIFRA has detected. They also seem to feel that they will be able to accomplish more in the future than appears likely.

There seems to be an inability on the part of many environmentalists to appreciate, either at all or at least to the full extent, such factors as the bias of much of the scientific input into pesticide regulation or the anti-regulatory mood of Congress and the public. They tend to think incrementally rather than systemically, proposing small changes to the law rather than sweeping provisions which might change some of the basic alignment of forces in the policy process.¹ For example they are somewhat aware of the bias of scientific input to FIFRA, but seem to lack an appreciation of the scope of industry influence, with its effects on pesticide testing, on the academic community, and on the public's

view of scientific questions. Because they lack an awareness of these systemic influences on the policy process, they rarely advocate legislative provisions aimed at correcting them.

Accurate data. The scientific data related to the regulation of pesticides should provide an accurate, unbiased analysis of the risks and benefits of these chemicals. Reliable data is needed by the Congress in its revision of the law and the EPA in its enforcement. In order to be aware of potential dangers to its health the public is also in need of accurate information. In particular farmers and farmworkers, a segment of the public in more contact with pesticides than most people, are in need of unbiased data.

We have shown that the flow of accurate data is strongly impeded:

1. by allowing the pesticide industry to supply its own data related to the testing of pesticides for registration
2. by the relation of the industry to the agricultural sciences and
3. by the success of the industry in communicating its theory of carcinogenicity.

The combined effect of all of the above relationships is that the basic tone of the pesticide debate is influenced in a direction which is beneficial to the interests of the industry. Given their inadequate resources, the environmentalists are often reduced to refuting an industry study here or offering an alternative explanation of carcinogenicity there. They can not present an alternative source of information which can even begin to rival the extensiveness of the industry's resources.

IPM. In the area of IPM, federal policy is, again, lacking. The use of IPM is not widespread.² According to the Congressional Office of Technology Assessment the evolutionary shift to IPM is too slow to have a significant impact except in a few instances.³ To review the criteria established in Chapter II, federal policy should encourage IPM through:

1. Research aimed at developing this technology
2. Education of farmers and IPM pest control advisors
3. Legal requirements that IPM methods be used to control pests whenever possible.

Of the above three criteria, the area of research is the one in which the most has been accomplished. There has been a substantial amount of funds devoted to IPM research; however many experts have argued that more funding is needed for success.⁴ In its 1979 report on IPM, the Council on Environmental Quality pointed out the need for more research support.⁵ The Congressional Office of Technology Assessment has also pointed out that, "an infusion of new funding is essential for success."⁶

Efforts at education have been far from those needed to familiarize farmers with IPM methods or to train the IPM experts who will eventually educate farmers. In 1975 the Congress did amend FIFRA to require that the EPA made sure that instructional materials on IPM were made available to interested individuals.⁷ However, this provision, which was evidently thrown in to placate the environmentalists, was a weak attempt to confront an educational problem of substantial proportions. In order to educate farmers about IPM, a technology which is somewhat more sophisticated than the use of chemicals, many more IPM experts will be needed. In its 1979 report, the Council on Environmental Quality pointed out that farmers and homeowners

use pest control information provided directly by the chemical industry far more often than that provided directly by the Cooperative Extension Service (CES) or by independent pest management advisors.⁸ This is because there are fewer CES pest control specialists and independent advisors compared to the number of chemical industry representatives. A study of California cotton farmers found that the great majority of pest control decisions were made on the basis of advice provided by industry salespeople.⁹ Specifically, only one percent of the pest control information which the growers used originated with farm advisors from the Cooperative Extension Service. Chemical company employees were the source of information in 70 percent of the cases surveyed and independent pest management advisors were consulted in only 17 percent of the cases.¹⁰

In 1977 there were, nationwide, about 1,120 specialists with the Cooperative Extension Service assigned to crop and animal health, an area of responsibility which includes IPM. There were also about 500 private consultants working independently or for farm service firms and farmers' cooperatives who advised and made recommendations on IPM. This compares with an estimated 200,000 commercial pesticide applicators who

are certified. This includes aerial applicators, pest control operators and other commercial applicators.¹¹

It can be seen that sources of information about chemical means of pest control far outnumber sources of IPM advice.

Extension demonstration programs are an important way of gaining the support of farmers who are apprehensive about trying new IPM technologies. Publicly supported extension demonstrations have been useful in demonstrating the feasibility of IPM for a variety of crops and a few livestock operations, but due to limited funding, these projects have not reached the majority of growers in need of information.¹²

There is a significant need for education to train IPM experts who can educate farmers. There is also a lack of personnel to conduct IPM research and develop IPM programs.¹³ As the Council on Environmental Quality points out:

The lack of understanding and support for interdisciplinary research projects and companion educational and demonstration projects at the public institutions is a major impediment to IPM. Researchers, educators, and administrators who understand the concept - that is, who are well informed in ecology, systems science, and allied biological sciences that are the backbone of the IPM strategy - are a distinct minority.¹⁴

There have been established no legal requirements that IPM methods be used to control pests whenever possible. The "use by permit only" classification of pesticides, which was proposed in the discussions surrounding the formation of the 1972 law, would possibly have provided a basis for the implementation of IPM. The law might have defined this classification in such a way that permits for the use of substances falling in this category would not have been granted if a satisfactory IPM method had been available.

The discussion of this proposal in 1971 and 1972 was the last serious discussion of legal requirements for the use of IPM. From time to time an environmentalist may advocate the "use by permit only" concept or the establishment of pest control districts in which all pesticide use by farmers would require approval by a pest control specialist. However most discussion of pesticide regulatory policy, including that of the environmentalists, has centered on the need to remove the most dangerous chemicals from the market or to restrict the ways in which they can be used. There has been relatively little emphasis placed on the idea of cutting down on the total amount of all pesticides used.

Congress: Avoiding Conflict

We now move to a political analysis of why the criteria just discussed have not been met. The explanation for this is rooted in the distribution of resources among the groups involved, the ways in which Congress deals with conflict and the mobilization of information.

No change in criteria. One might well ask why if Congress has tended to be so unhappy with the EPA's administration of FIFRA, it has not passed laws which clearly require the EPA to do exactly what it wants? Most congressional criticism of the Agency's administration of FIFRA claims that it is too strict, that the EPA should be more willing to allow farmers to use controversial pesticides. If those legislators who think this way desire to have the EPA do what they want, a first step in this direction would be to pass a law requiring this. They might pass legislation which specifically prohibited the Agency from banning such controversial pesticides as DDT, 2,4,5-T, chlordane/heptachlor, aldrin/dieldrin, and 2,4-D. Alternatively, they might specify new standards with which to consider pesticide registrations. The

present standard directed by FIFRA (unreasonable adverse effects) is very broad. Congress, if it wanted to, could change this standard by changing the law. The new standard for banning a pesticide might be more specific. It might specifically direct the EPA to allow the use of a chemical unless it did not conform to specified criteria in specified laboratory tests. These tests and criteria could be selected in such a way that many of the chemicals which are now banned, would be back in use.

On the other hand if the smaller number of legislators who criticize the EPA for not being strict enough wished to do something to change this situation, they could introduce legislation which set stronger environmental standards for the EPA to implement. They might require the establishment of the previously discussed IPM Pest Management Districts in which all pesticide use was approved by a local pest management expert. They might also require that all pesticides which specified tests indicated to be carcinogenic would be banned unless specified economic criteria were met, these criteria indicating the extreme economic importance of the product.

The legislators could do this, but they don't. Criticism of EPA decisions is strong by those on both sides of the environmental issue, but rarely is there an attempt to make more specific the very broad basic criteria on which pesticide decisions are made. On the rare occasions when such an attempt is sponsored by one or a few legislators, it is defeated. FIFRA has been weakened, but by the introduction of many small changes many of which make the EPA's job more difficult and by congressional interference with administration. Since 1972, there has been no clear change in the criteria for the registration of pesticides. One can argue that by not delineating clearer standards for the EPA, Congress has delegated to that agency a degree of responsibility which the legislators might otherwise have had to face.

Because of the broad standard of "unreasonable adverse effects" the EPA shoulders much political responsibility. Farmers dissatisfied with the EPA decision to ban most uses of DDT tend to blame the Agency for interpreting "unreasonable adverse effects" in the way it has. On the other hand, environmentalists who are upset with the Agency for not banning a particular chemical, tend to blame it for not being more environmentally oriented in its interpretation of the standard.

Furthermore its constant involvement in administrative decisions on controversial pesticides keeps the EPA in the forefront of public visibility in regard to the issue.

In having to determine the meaning of a broad and controversial standard, and in being highly visible in relation to conflicts brought on by the existence of so broad a standard, the EPA assumes much of the political responsibility which Congress might otherwise have had to shoulder. A reasonable amount of discretion is required for the Agency to regulate pesticides, but if the standards for pesticide registration were considerably more specific, the role of the Agency would be less one of making controversial decisions and more one of judging the extent to which chemicals proposed for registration met congressionally specified standards.

Some theoretical explanations. Several political scientists have commented on the tendency of Congress to delegate responsibility. For example Randall Ripley and Grace Franklin note that while delegation of authority to the executive branch allows Congress to keep its workload manageable, that body sometimes intentionally uses delegation in order to delay making a final

decision.

A clear-cut policy decision may result in penalizing or angering some groups, which can manifest their unhappiness by withdrawing their support from members of Congress. If the members perceive that they would lose a great deal of support, they may choose not to state a clear policy and leave the policy outcome ambiguous by delegating decision making to parts of the bureaucracy, or to regulatory commissions or to the courts, with only vague congressional guidance. Thus the winners and losers affected by the policy are less clearly defined and the responsibility for decision making is deflected from Congress to other agencies.¹⁵

Perhaps the best known analysis of congressional delegation of authority has been made by Theodore Lowi who has criticized any delegation which is not accompanied by clear standards of implementation. According to this author the typical American politician displaces, defers and delegates conflict wherever possible. By broadly defining the power of administrators, the politician can avoid the conflict which might otherwise result from the clear choices required by specific standards of implementation. For Lowi, however, the opportunity that it offers congressmen to avoid conflict is more a result of broad delegation than a fundamental cause of it. The primary reason why lawmakers choose to enact legislation in this manner is rooted in a public philosophy that holds that all issues should be

bargained rather than settled by a fixed rule of law.¹⁶

Morris Fiorina agrees with Lowi that the delegation of authority is too broad, and argues that we can expect the continued abdication of political responsibility by Congress. He disagrees, however, with Lowi's explanation of why delegation is so broad. Fiorina sees this practice as rooted in the aims of individual congressmen who adopt (or appear to adopt) a public philosophy based on pluralist tenets because it rationalizes what their political self-interest dictates. The typical legislator is, according to Fiorina, likely to think along the following line:

Why take political chances by setting detailed regulations that are sure to antagonize some political actor or another? Why not require an agency to do the dirty work and then step in to redress the grievances that result from its activities? Let the agency take the blame and the Congressman the credit.¹⁷

Along this line of reasoning, Fiorina quotes author Peter Woll approvingly.

A major reason for the power of the bureaucracy in policy formulation is the frequent lack of congressional incentives to adhere to the Schechter rule and establish explicit standards for administrative action. This is particularly true in the regulatory realm, an area involving political conflict that legislators often wish to avoid. Congress is always willing to deal rhetorically with problems requiring regulation and with the area of regulatory reform, but real decision on the part of the legislature will

undoubtedly raise the ire of powerful pressure groups on one side or the other that are affected by government regulation.¹⁸

Author Michael T. Hayes provides further development for the concepts described by Lowi and Fiorina. Hayes sees the broad delegation of discretionary power as not merely the passing of a political problem on to administrators, but also as a conscious attempt to pass an ambiguous bill which will be interpreted as a victory by both sides, and which often is actually a disguised choice in favor of one side.¹⁹

In describing a number of policy types this author notes that when conflict between interest groups is present the most likely outcome will be a regulatory policy. Often this type of policy is produced when established and threatened groups which would preserve the status quo are faced by challenging groups which are strong enough to force some congressional response. This response normally takes the form of a discretionary and essentially symbolic bill. The result is that the group conflict is not resolved in the visible public arena, but is passed on to the bureaucracy or courts to be accommodated there. Bills passing political problems on to administrators are constructed in such a way that they appear to be a victory to both sides, but

they are ambiguous by design and constitute a collective decision by Congress to avoid choice. They are, as Hayes puts it, "an exercise in duplicity."²⁰

Not all delegations of discretionary authority are alike. Some do not at all resolve the legislative struggle. They create instead a conflictual administrative process for which the outcome is indeterminate. Others produce an administrative process almost certain to be dominated by the organized at the expense of the unorganized. This is particularly true whenever an organized interest is opposed by a mass public. In such a case accommodations are likely to be worked out between the regulators and the regulated groups at the expense of the general public. A time lag which sometimes occurs between enactment and accommodation merely allows for a period of tentative public attentiveness to the regulatory process and a cosmetic period of regulation in the consumer interest which is designed to provide symbolic reassurances that the intent of the statute is indeed being followed.²¹

In passing the laws authorizing these administrative processes, Congress is aware of who will benefit and who will lose as a result of them. As Hayes puts it:

Lowi is not entirely correct, then, in asserting that the danger in delegation lies in the refusal

of Congress to choose between conflicting groups. In a very real sense, Congress does choose when it creates these consensual administrative processes insofar as the ultimate outcome is foreordained. Under such circumstances, the real effect of delegation is not so much to avoid choice as to disguise it.²²

Public acceptance of regulatory structures and outputs which fail to uphold its interests is facilitated by the generation of symbols. Using concepts developed by Murray Edelman, Hayes theorizes that members of the mass public see the attainment of information on policy issues as having a very high cost and will usually not obtain enough information to identify their interests on a given issue. Consequently they are vulnerable to symbolic reassurances that these interests are being protected.²³

FIFRA: a disguised choice. Pesticide regulation tends to fit well into the just described theoretical interpretations. According to Hayes a regulatory policy is the most likely result of a conflict between interest groups. The federal Insecticide, Fungicide, and Rodenticide Act of 1972, which established the basic pesticide regulatory structure which exists today, was the result of a conflict between established farm and industry groups and relatively new environmental groups. Even in 1972 the

environmental groups were less organized and not as numerous as their adversaries, but they did exert an appreciable amount of influence due to the strong public support for environmental issues which existed at the time and the publicity which Rachel Carson's book and the ensuing congressional and presidential committee reports had given to the pesticide issue. A public response was needed and the result was the passage of an ambiguous and essentially symbolic bill which delegated a large amount of discretionary authority to the EPA in order that the legislators could avoid the political responsibility for pesticide regulatory decisions.

As Fiorina points out in quoting Woll, the lawmakers are certainly willing to deal with the problem rhetorically. The pages of the hearings on FIFRA abound with critical congressional remarks concerning the EPA's actions in regard to aldrin, heptachlor, DDT, toxaphene, or the pesticide hotline. Calls for more liberal pesticide decisions in order to combat grasshoppers, the fire ant, or coyotes are an Agriculture committee ritual; however real proposals to make fundamental changes in the criteria set by the 1972 law are extremely rare. Instead changes in FIFRA are confined to small alterations

in the law making enforcement more difficult and complicated while legislators discourage rigorous enforcement by the EPA by pressuring the Agency in hearings and threatening to pass more restrictive legislation.

One exception was the proposal discussed in Chapter IV to amend FIFRA to allow the use of Mirex. Had this measure, which was approved by the House Agriculture Committee, passed the full House and Senate, it would have been a clear alteration of standards, an unmistakable weakening of the discretionary authority of the EPA. Probably for this reason, the measure did not pass and it is arguable that its sponsors knew all along that it would not, and only introduced the bill as a club with which to bargain with the EPA concerning its position on the use of Mirex. The fact that some legislators did vote for the measure suggests that there are some who are willing to clearly change standards, but the defeat of the bill supports the contention that most of them are not.

FIFRA is ambiguous because it lacks clear standards. The fundamental criterion for banning a pesticide, "unreasonable adverse effects," is a very broad one. It is defined as "any unreasonable risk to man or the

environment taking into account the economic, social, and environmental costs and benefits of the use of any pesticide."²⁴ It is up to the EPA to decide the relative merits of costs and benefits in determining what is unreasonable. Given this broad area of administrative discretion it is inevitable that political considerations will enter into decisions about how costs and benefits will be balanced in deciding about pesticide registrations. The EPA employs a complicated decision making process in making these decisions. This process is lengthy and includes ample opportunity for administrative hearings and court appeals. However because of the political considerations which the broad criterion for registration permits to enter into the process, there is no reason to believe that the impressive administrative structures surrounding FIFRA will lead to consistent decisions. There is no reason that because Pesticide A is banned or permitted to stay on the market, a decision on Pesticide B, which is a similar product, will be the same.

In the administration of FIFRA, an emphasis on form displaces considerations of substance, as problems which Congress might have dealt with more squarely are handled through a complicated bureaucratic decision

making process or lengthy court hearings. A focus on administrative process distracts energy and attention which might otherwise be directed at examining the fundamental norms underlying the legislation. If there is a problem, the response is to invent a new administrative procedure, but basic directions are ignored.

Although the changes made to FIFRA since 1972 have tended to weaken the bill, the lawmakers have included some changes aimed at satisfying the environmentalists. An example is the provision passed in 1975 that IPM instructional material be made available to those interested in it. Thus when addressing the local farmers a lawmaker, say in 1975, could refer to the provision in the recently revised FIFRA requiring consultation with the Secretary of Agriculture, or the provision prohibiting the EPA from requiring a written examination as proof of a grower's competence to handle restricted pesticides. To the environmentalists in his district concerned with what he is doing about pesticides, he could refer to the provision for supplying IPM material.

Hayes notes the tendency of the administrative process resulting from a congressional grant of discretionary authority to be dominated by the organized at the expense of the unorganized when an organized

interest is opposed by a mass public. In such a case accommodations are likely to be worked out between the regulators and the regulated at the expense of the general public.

It would not be correct to refer to the public in its relation to the pesticide issue as completely unorganized. Several environmental groups involved in the issue have been described, but it has also been pointed out that these groups are fewer in number and have less resources than their adversaries. However if we refine the above thesis of Hayes to read "dominated by the organized at the expense of the substantially less organized when an organized interest is opposed by a mass public," then we can argue that pesticide policy fits generally into this pattern. Policy outputs tend to be more in favor of farm and industry interests rather than the interest of the public in protecting the environment. However domination of the pesticide policy process by farm and industry groups is more the result of the basic structure of the law which these groups have managed to get Congress to pass, than an accommodation with the EPA.

The EPA has been exceedingly inefficient at administering this law and decisions on registration have often taken an excessive amount of time. Many of the Agency's decisions have been strongly criticized by the environmentalists, and the fact that it takes so long to make a decision on whether or not to register a substance means that there may be many dangerous pesticides on the market which will not be removed until they move through the lengthy decision making process. However the Agency has made some decisions which have been quite beneficial to the environment. For example it has banned most uses of DDT, aldrin/dieldrin, chlordane/heptachlor, and endrin. Some of these decisions were made in the face of excessive political pressure as when Administrator Russel Train banned most uses of chlordane/heptachlor in August, 1975 in the face of opposition from Congress and industry lobbyists.²⁵

Within the structure authorized by the present law there is not much which the EPA can do to improve the environmental situation resulting from the use of pesticides. Given the complexity of the law which it must administer, the limited resources of staff and money which are available to it, and the continued harassment

of its enforcement efforts by Congress, it can remove only a relatively few of the most dangerous pesticides from commerce. Because of these problems, an increase in the Agency's efficiency would, at best, increase the number of regulatory decisions conducive to a sound environment by only a relatively small margin. Furthermore, even if the Agency could make timely decisions on the registration of all pesticide products on the market, it would only have solved a part of the pesticide problem. A fuller solution would require a considerable decrease in the amount of pesticides used, and the present law authorizes no structure aimed at achieving this criterion. The present regulatory process centers on a relatively few battles over the use of several controversial pesticides. There is no structure, such as an IPM district, aimed at controlling the use of all pesticides.

Hayes points out that a time lag which sometimes occurs between enactment and accommodation merely allows for a period of tentative public attentiveness to the regulatory process and a cosmetic period of regulation in the consumer interest which is designed to provide symbolic reassurances that the intent of the statute is indeed being followed.

This portion of his theory also seems applicable to the pesticide issue, again with some qualification. FIFRA has always been an essentially weak law and there has always been much to criticize in the enforcement efforts of the EPA, however the law was stronger before it was first weakened in 1975. Furthermore, as described in Chapter III, EPA enforcement efforts tended to be more vigorous before 1976 when the Agency's less than enthusiastic enforcement efforts prompted three of its lawyers to resign and five more of its employees to complain in Senate hearings about the Agency's failure to take action, its failure to carefully examine health and safety data, and its poor organization and inadequate resources.²⁶ As has been said, we cannot argue that there has been an "accommodation" between the EPA and those whom it regulates, because the Agency does, at least occasionally, take some actions opposed to the interests of the regulated. A time lag has occurred, however, between more vigorous enforcement and less vigorous enforcement.

The other problem with Hayes's theory is that he speculates that the time lag in question is "designed" to provide symbolic reassurances. The evidence related to the pesticide issue suggests that the time lag does

provide symbolic reassurances, but whether or not this is by "design" is a difficult to determine question of motivation.

In 1972 public opinion was strongly in favor of producing a more healthy environment and the pesticide issue, especially in the context of DDT, was highly visible. However by 1975, public enthusiasm for the environment was not as high and less attention was being paid to this issue. In 1972 administrators may have tended to be more bold because they were aware of the public's generally approving attitude toward their efforts. By 1975 or 1976, a less enthusiastic public was likely to provide less support for controversial EPA decisions. Also because of public opinion Congressmen who may have wanted to weaken the law in 1973 or 1974 were possibly discouraged from this until 1975.

Thus it appears that the time lag which occurs between more vigorous and less vigorous enforcement (and, we might add, between the initial legislation and efforts to weaken it) is less a result of a design, than a response to the political conditions surrounding administrators and legislators.

Since 1972 FIFRA has been weakened and the EPA's enthusiasm for pesticide enforcement, although not

extinguished, has been substantially diminished. The EPA occasionally takes a dramatic action in relation to pesticide enforcement, but the general trend is as just described. In order to achieve this effect on pesticide regulation, Congress has devoted considerable attention to it, revising the law three times and frequently putting pressure on a sometimes uncooperative EPA. When the EPA used the 1972 law to justify a level of regulation which Congress felt was too stringent, the lawmakers weakened the law in 1975. The same process took place in 1978 and in 1980. In defense of Congress, one might argue that to the extent that this is so, it is all a mistake, it is the misguided result of sincere legislators who truly sought to revise FIFRA in the hope of further promoting the public interest. The revisions to the law were made in the interest of bringing more rationality and science into the regulatory process. If the result was that it made the law weaker and more complex and difficult to administer, this was an unintended consequence of well meaning efforts.

This dissertation argues, on the contrary, that the example of pesticides suggests that when it passes political problems on to the bureaucratic sphere, Congress is aware of who will win and who will lose. Hayes is

correct in arguing that in a very real sense, Congress does choose when it creates administrative processes insofar as the ultimate outcomes are foreordained. Thus the real effect of delegation is not so much to avoid choice as to disguise it.

Legislation, pressure and selective perception. The argument to support these contentions about the motivations of congressmen must be based on an assessment of their knowledge and patterns of behavior. Specifically, the evidence to support these claims is centered in the following three factors:

1. The results of years of legislation produced by reasonably knowledgeable and able legislators
2. The administrative pressure put on EPA officials, and
3. The tendency of the legislators to selectively perceive information.

The first point assumes that most congressmen are reasonably intelligent and politically sophisticated. It seems reasonable to argue that those who have had enough political sophistication to be elected to Congress, also have enough sophistication to realize what the probable outcomes of their legislative actions

will be. Of course no one, no matter how sophisticated or intelligent, can know the exact outcome of laws which are passed, but it seems that most legislators are aware of the general directions which policy will follow in response to legislative changes. The general trend for FIFRA in the years which this study has focused on (1972-1980) has been a weakening in the law and its enforcement and no movement toward what we have defined as an adequate condition in relation to the public's interest in the use of pesticides. If the legislators were concerned about moving toward a regulatory situation which would support the public's interest, it is reasonable to assume that they might occasionally make a mistake and enact a measure which supported the farm or industry interests at the expense of the public. It does not seem likely, however, that given the reasonable level of intelligence of congressmen, their experience, and their political sophistication, they would have passed as much legislation as they have without realizing what the effects of their actions were likely to be. Legislators are not naive. They have enough intelligence, experience, ability and political sophistication to realize that the effects of their activity in relation to FIFRA would be

to weaken it.

The second point involves the administrative pressure put on EPA officials by the legislators. Even if we did assume that congressmen are somewhat naive and often fail to realize what the effects of their legislative activities will be, the pattern of administrative interference with EPA enforcement which this dissertation describes, clearly indicates the intent of many legislators. A favoring of the interests of industry is obvious in cases such as the "pesticide hotline" or the use of DDT to control the tussock moth. There are some legislators who pressure the EPA in the opposite direction, that is, in the direction of more environmental protection, but the primary vectors of congressional pressure are aimed in a direction favoring industry.

The third point is based on the assumption that legislators who approached a policy issue with a desire to avoid favoring particular interests would attempt to obtain information from various reliable sources in order to develop an objective as possible understanding of the policy problem. This assumes that objective assessment is facilitated by obtaining information from parties with different goals and points of view. On the other hand, lawmakers with predetermined opinions would

be more likely to selectively seek information which they could use to legitimatize their already chosen positions.

In Chapters III and IV we noted the strong tendency of the legislators to readily accept information from some sources and to reject it from others. While reports, data and testimony from the farm and pesticide industry receive the attention of most of the legislators interested in FIFRA, the many GAO reports, the information supplied by environmentalists, and the reports of a few congressional committees (all of which tend to point out the need for stricter legislation to protect the environment) are ignored. This selective perception of information, especially that emanating from its own GAO, surprised the writer. One might think that a GAO report which suggested that stricter legislation was needed to protect the public would either be criticized by those legislators in favor of industry goals, or treated symbolically in the form of vague commitments to correct the problems noted. Instead these reports seem to be treated as if they don't exist. They are simply ignored.

This observation of congressional behavior confirms Kenneth Entin's finding in observing the House Armed

Services Committee. Entin noticed a similar tendency of legislators to use or reject information. According to him, the initial reference in the choice process of legislators is internal. Committee members are likely to evaluate and react to a message in terms of the various biases which condition their behavior, and they communicate with outsiders only if they respect their intentions and the accuracy of their information. Thus the information role of interest groups is minimized. Legislators communicate with these groups primarily in order to legitimate decisions already made and increase committee member confidence.²⁷

Thus the findings of this investigation tend to confirm Hayes's contention that congressmen do choose and are aware of who wins and who loses. Delegation is not an effort to avoid choice, but to disguise it. Choice is disguised by the rhetoric surrounding the adoption of new measures and by the fact that many of the changes made in the law seem by themselves to be either only slightly in favor of industry or a mere procedural innovation designed to increase the accuracy of decisions. Taken together, however, they comprise a substantial weakening of FIFRA because of the cumulative effects of small changes which favor industry,

and because of the burden of complexity which they add to an EPA which possesses limited resources. We have argued that the legislators are generally aware of the choices they are making. This argument is based on the results of years of revision of FIFRA, the political sophistication of legislators, the administrative pressure which they put on the EPA and their selective perception of information.

Legislative revision and congressional pressure: a continuous process. While the findings of this dissertation tend to strongly support the observations of Ripley, Franklin, Fiorina, Lowi and especially Hayes, they also suggest a need for further theoretical explanation. These authors describe the tendency of Congress to avoid political responsibility by delegating too much discretionary authority to the bureaucracy. Their analyses tend to stop, however, at this point; that is, they note the delegation of responsibility but do not look at what happens once that responsibility has been delegated. They do not analyze the congressional-bureaucratic interaction which occurs subsequent to the act of delegation. From reading their theories one might assume that once a legislative delegation takes place,

that is the end of Congress's interest in the issue. However this investigation suggests a different interpretation.

This study suggests that when the outcome of the congressional delegation of authority is not what the legislators want, they will take continuous action aimed at producing the desired policy outcomes. This interpretation sees congressional involvement with policy in at least some issue areas as an ongoing, continuous process. In those policy areas where there is a high degree of congruence between the goals and opinions of bureaucrats and legislators, it seems reasonable to assume that congressional involvement with policy will be relatively infrequent. If administrators in these policy areas tend to produce outcomes desired by legislators there is little need to interfere.

On the other hand, this study suggests that in those policy areas characterized by differences in the goals and opinions of legislators and bureaucrats, there is likely to be a continuous congressional involvement rather than an infrequent revision of the law. Many EPA officials, especially those who formerly worked in the Department of Agriculture, tend to see the pesticide issue from a point of view which is similar to that of

Congress. Some, however, tend to favor a more stringent regulation of pesticides. The resultant of the interaction of these forces within the EPA is a level of regulation which has never satisfied environmental interests but which has often been more stringent than the legislators desired.

In 1972 Congress passed an essentially symbolic bill. However a relatively enthusiastic EPA, charged by public support and some idealistic, enthusiastic personnel, enforced this bill more vigorously than Congress had intended. They did this by interpreting the broad criterion in the bill of "unreasonable adverse effects" in a way which led to the banning of several substances. The farmers and the pesticide industry complained to Congress, and especially to Agriculture Committee members. This led to proposed revisions of FIFRA and hearings in which the committee members continuously charged the EPA with not following the "intent of Congress." FIFRA was revised in a way that made it a weaker law. The subsequent revisions in 1978 and 1980, the frequent administrative interference of Congress and the practice of authorizing money for FIFRA enforcement on a yearly basis, have all been aimed at bringing the more environmentally oriented EPA into line

with Congressional desires. Congressional involvement with FIFRA, primarily through the Agriculture Committees, is a constant, ongoing process in which the legislators continuously try to impose their will on a sometimes unsubmitive EPA. Pesticide policy involves a struggle between Congress and the EPA. The weakening of FIFRA over the years and the more cautious EPA attitude on enforcement indicates that Congress has had the upper hand in this struggle. However there is no undisputed winner. If the EPA regulated pesticides too strictly, Congress could and would weaken the law even further, making the Agency's job more difficult or removing some of its enforcement authority. It would also increase its pressure on the EPA bureaucracy. On the other hand, if Congress took away all or most of the Agency's authority to regulate pesticides, or if it withheld the resources needed for the Agency to provide at least a minimal level of regulation, the editorial and public outcry could be substantially damaging.

Thus we can add to the theory developed by Hayes et al. in order to more thoroughly describe the situation which occurs when the will of Congress conflicts with an agency, such as the EPA. If an agency enforces legislation, if not vigorously, at least more vigorously than

Congress had wanted, Congress will not remain inactive. If the results of the administrative process do not tend to adequately support the interests of the parties favored by the legislators, they are only too willing to correct the situation by interfering directly in the administrative process and by weakening the law.

Depoliticizing FIFRA. All this takes place within a context of depoliticizing of the pesticide policy process. Depoliticizing equates to what Hayes would call a disguising of choice. To the maximum extent possible the issue is removed from the realm of conflict by reducing the visibility of changes made in the law and, to the extent that the visibility of change is not reduced, by providing a set of explanations for congressional actions. The visibility of change is reduced by making numerous small changes in the law rather than a few large ones, by constructing many of these changes so that the statute has been made needlessly complex and by weakening the law by weakening efforts to enforce it.

The explanations offered for their actions by the legislators are important in understanding this policy issue and suggest the importance of the role of language. Legislators justify their actions by referring to the

need to solve the world food problem, the importance of balancing risks and benefits, the importance of agriculture to the national economy and especially the need for more "rationality" or "science" in decision making. Alterations in the law are rarely described as value choices which will affect one interest at the expense of another, they are rational procedures introduced for the purpose of increasing the scientific quality of the regulatory process. The approach to science, however, is anything but objective. The results of scientific investigations which confirm the lawmakers' points of view are often cited while other work which suggests an alternative interpretation is ignored.

Language. Two important ways in which language is used are:

1. To legitimate the choices of legislators and
2. To influence the opinions and perceptions of lawmakers and the public.

Understanding the first of these uses requires a relatively short term time perspective, the second demands a relatively longer view.

A few pages back we described the tendency of legislators to selectively perceive information and we

referred approvingly to Entin's explanation of this behavior. For him the initial reference in the choice process of lawmakers is internal. Legislators accept or reject information on the basis of the various biases which condition their behavior. Thus the information providing role of interest groups is minimized. In the relatively short time spans related to the making of changes in FIFRA, interest groups are important not so much as suppliers of information which may change a legislator's decision, but as sources of information with which to legitimate decisions already made and increase the confidence of the lawmakers in the decisions they have made.²⁸

Influencing bias. If Entin is correct in claiming that the biases of legislators condition their behavior in regard to their reception of information, what are the sources of these biases? Why are legislators biased in favor of certain interests? To examine this question, one must think systemically and in terms of long term influences on values. Certainly important in understanding the formation of a legislator's biases are his political philosophy, the values of his constituents and what he knows about specific policy questions. This

dissertation has employed a systemic perspective in order to examine one of the variables related to the long term formation of biases, that is, the flow of information, the source of what the legislator knows. The types of information available to legislators can not but influence their choices. The same is true of constituents, and information which influences constituents is likely to have a long term influence on their political representatives. In a similar manner, the information available to regulators is likely to affect their decisions. If most of the information which lawmakers and citizens obtain from the press, television, hearings, and contact with lobbyists describes the advantages of pesticides, minimizes their dangers, and emphasizes their economic importance, it is not surprising that many legislators and members of the public do not press for more stringent regulation. If the data submitted by a manufacturer to the EPA in order to support the registration of a pesticide indicates that it is safe, it is not surprising that the Agency registers the substance.

Considering information in this broad context, there are sources which supply data to support the arguments of both the environmental and the industry

sides of the pesticide issue, however the industry side tends to dominate. Data tending to support an environmental perspective is produced by some public interest groups, some environmentally oriented scientists, the EPA, and, sometimes, the General Accounting Office. On the other hand data indicating the safety and usefulness of pesticides is produced by many industry associations, many individual companies, and many agricultural institutions. Most of the time the variation in the scientific conclusions produced by the opposing environmental and industry interests can be explained as varying and scientifically valid interpretations of the same data. To a lesser extent, as has been shown, there is fraudulent manipulation of data. To the extent that varying results are based on differing interpretations of the same data, both of which are scientifically valid interpretations, the science surrounding the pesticide issue tends to become a political activity in itself. Environmentalists and industry representatives struggle to have their interpretations of data accepted by lawmakers and the public. We have argued that industry, because of its greater resources, is the dominant participant in this struggle. The dominant position of the industry can be seen by looking at its

economic influence on the scientific superstructure which produces information related to pesticide safety and usefulness. We have described this influence in three chapters: one which described the industry influence over the safety data used to support pesticide registrations; one which examined the relation of the industry to the nation's agricultural colleges, and one which looked at the industry's effect on public understanding of carcinogenicity.

In order to understand the pesticide issue one must look not only at the "political system" as it is often viewed by political scientists, that is, a view which focuses on a Congress receiving inputs from interest groups and producing policy outputs. It is necessary to take a wide view and a long term one, to look at the political culture which forms the context of pesticide policy. In looking at this political culture this dissertation has described how the economic power of farm and chemical company interests has been mobilized in the areas of pesticide testing, agricultural research and carcinogenicity testing. The result of this mobilization of economic influence has been an influence over the public's and legislators' understandings of the pesticide policy issue.

What follows is a brief look at other aspects of political culture which are related to many issues rather than only the pesticide question.

Other Explanations

Attitudes and knowledge. Thus far we have explained why pesticide policy is inadequate by focusing on variables directly related to this issue. These include: the nature of FIFRA, the greater resources of the pesticide companies and farm organizations, the flow of information, the political pressures put on the EPA by Congress, and the tendency of legislators to avoid responsibility for political choice by delegating excessive discretionary authority to administrators in such a way as to favor industry interests while disguising this choice of interests.

Two other causal variables are beyond the scope of this dissertation because they function at a different level of analysis, a higher level of abstraction. These variables are characteristics of the political culture in which pesticide regulation occurs and they are important enough to mention here. They are public attitudes concerning cooperation and the good of the

community, and public understanding of environmental problems. In their book The Politicized Economy, authors Michael H. Best and William Connolly point out that in order to solve many substantial environmental problems there will have to be changes in attitudes concerning cooperation and the welfare of the community.²⁹ These attitudes, they explain, are rooted in economic, social and political structures which presently encourage minimal concern for the welfare of the community. Connolly and Best describe this lack of concern:

Are the costs of recycling and of modernizing waste disposal systems worth it to us when there is no internalized "we" that any of us naturally identifies with? Is the future condition of this stream, this park, this local atmosphere, this soil of deep concern to me when my relatives live elsewhere and my children are also likely to move? When I am likely to be a transitory resident myself? Will I tolerate high tax levels and the curtailment of consumer purchases to protect the environment for others when the promise of consumer pleasures and the dangers of personal insecurity provide my basic incentives to work?³⁰

The solution of many environmental problems, including pesticides, will require at least some dislocations which will be perceived by a substantial number of those who are regulated as burdens. In the absence of a substantial atmosphere of cooperativeness and concern for the welfare of the community, it is unlikely

that these burdens will be readily accepted. Without a high degree of cooperation the best that could be obtained in relation to pesticide regulation would be the imposition of strict regulations on a vast chemical and farm industry opposed to this regulation. Given the opportunities for evasion of stringent regulation, adequate enforcement would be either impossible or astronomically high in cost.

Furthermore, although pesticides may harm many, their effects are often difficult to establish. Many argue that they cause cancer, but the chances that they will cause cancer in any one individual are low. Many citizens may see their own chances of getting cancer from pesticides as low, and if their concern for the welfare of the community is not high, they may not see the damage which these substances may cause to others as a sufficient reason for investing their time in attempting to understand the problem and advocate a solution.

Public understanding of environmental problems must be increased if environmental issues are to be treated with the priority they merit. The problem of public knowledge is best treated in the context of a discussion of possible solutions to the pesticide problem.

On solutions. At this point, many policy studies customarily offer some proposed solutions to the policy problem being analyzed. Following custom we will mention several steps which, if followed, would significantly improve the pesticide regulatory situation. These are:

1. Invest more resources in IPM research
2. Invest more resources in the transfer of known IPM technology to growers
3. Establish IPM districts
4. Devote more resources to the EPA
5. Revise FIFRA in order to provide the EPA with clear standards and a strong mandate to protect public health and the environment
6. Remove FIFRA from the jurisdiction of the Agriculture committees.

Other recommendations centering on the testing of pesticides and the influence of industry in the agricultural schools have been discussed in previous chapters.

All of these recommendations would help to strongly improve the pesticide regulatory situation; however they are not likely to be implemented because within the present context of American political culture they are not politically feasible. They are not feasible because of what has been discussed as characteristics of the

political culture in which pesticide regulation occurs, that is a public lack of understanding of ecological problems, and attitudes toward cooperation.

Many members of the public are not aware of the potential effects of pesticide chemicals including their potential to cause cancer, often after long latent periods. Furthermore there is little public understanding of the additive effects of pesticides when combined with other chemical residues in the environment or the synergistic interaction of pesticides with other chemicals. Nor is there much public understanding of how little is known about these phenomena. Public knowledge is also lacking concerning insect resistance, and the assumptions made by scientists who imply that specific pesticide products are safe. Because the public lacks this type of knowledge concerning the potential harm which pesticides can cause, it is unlikely to support substantial reforms of pesticide regulation.

If farmers had to operate within an IPM district all pesticide use decisions would have to be made by the local pest control expert who supervised the district. Whenever possible, biologically sound IPM methods would have to be used in lieu of pesticides. Initially, at least, farmers would most probably find it a burden to

learn the new IPM methods and irksome to accept regulatory authority concerning decisions which were once up to them. In the absence of attitudes emphasizing the importance of cooperation in confronting social problems, it seems likely that they will oppose the inconvenience and irritation of IPM Districts.

Implementing the measures proposed above as solutions to this policy problem will require changes in political structures, attitudes, and public understanding which will make them feasible. Changes in political structure must foster attitudes centered on cooperation. Changing public understanding will require education of the public about the nature of ecological problems and, in particular, the potential of some ecological problems to cause long term environmental damage. There must also be developed a greater public awareness of the subjective aspects of science, a greater ability and disposition to separate scientific opinion from fact.

Closing Observations

We have looked at the criteria for pesticide regulation established in Chapter II and determined that the present regulatory situation does not meet these

standards. The reasons for this are rooted in:

1. The distribution of resources among the groups involved
2. The ways in which Congress deals with conflict, and
3. The mobilization of information.

Resources. A fundamental advantage of the pesticide companies and farm groups is their resources in terms of money and organization. In hearings, or in communication with legislators, these interests far outnumber environmentalists and can thus generate and distribute more information. In the long term, the resources of industry enable it to mobilize information related to this issue and consequently to influence the opinions of citizens and legislators. A counterweight to the pull of industry is exerted by the public but, except for the environmental groups which possess inferior resources, the public is unorganized and is unlikely to have much knowledge concerning this complex issue.

Congress: depoliticizing and dealing with conflict. In analyzing how Congress deals with FIFRA, we have described how the findings of this research confirm or differ from

the theories of several political scientists. Congress could change the law in order to implement the preferences voiced by many legislators. It could do this by enacting a statute which provided clear standards for the EPA. Of course in an area of policy involving as many technical concepts as pesticide regulation does, it would be necessary to delegate a substantial degree of discretion to the Agency, but if legislators wished to achieve through legislation the goals which they often express verbally, it would be possible to make more specific the very broad standards which the present law establishes while leaving the Agency needed discretion in how to go about the enforcement of those standards.

It has been argued that while Congress could make standards more specific, it does not because it wishes to delegate the political responsibility for pesticide decisions to the EPA. The broad delegation of responsibility in FIFRA is not, however, merely the passing along of a political problem to the bureaucracy. It is a conscious attempt to pass an ambiguous bill which will be interpreted as a victory by both sides. FIFRA is a disguised choice in favor of industry. We have shown how it is a bill which favors industry by extensively describing the bill. Furthermore the advantages which the

bill gives to industry are no accident. It has been argued that the fact that the regulation of pesticides has not met our criteria for adequate regulation is the result of conscious choices of lawmakers in favor of industry rather than the unforeseen consequence of well-intentioned acts. This argument is based on the knowledge and political sophistication of lawmakers, the pattern of congressional pressure on the EPA bureaucracy, and the tendency of legislators to reject information indicating that more stringent pesticide regulation is needed.

The choice is not only conscious, it is disguised by depoliticizing it. The pesticide issue is depoliticized by reducing the visibility of change and by providing explanations for congressional actions. The visibility of change is reduced by making many small changes rather than substantial alterations of basic criteria, by making the statute needlessly complex, and by weakening enforcement by pressuring administrators. In offering explanations for their revisions of FIFRA lawmakers tend to cite the costs and benefits of pesticides, the need for a greater food supply and, in particular, the need to introduce "rationality" or "science" into the regulatory decision making process. The approach to science is, however, highly selective.

Information which tends to indicate that planned legislative changes would not be wise is ignored. The function of information in this policy area appears to be, from a short term perspective, the legitimatization of decisions which are already made and the increasing of the confidence of lawmakers in their legislative choices.

The pesticide policy issue suggests the importance of looking at the ongoing processes of revision of the law and pressuring of bureaucratic officials. If the policy goals and opinions of administrators and congressmen are substantially different, this research suggests that congressional involvement in the policy area will be high. If the outcome of the congressional delegation of authority is not what the legislators want, the basic statute or statutes will be revised relatively often, money will be authorized on a short term basis, and congressional pressure on the bureaucracy will be high.

Mobilizing information. The long term influence of the industry on the opinions of the public and legislators has been looked at by examining its ability to mobilize scientific information. The science surrounding the regulation of pesticides is, in part, a political activity as proponents of alternative theoretical

explanations of the same research data compete in promoting their theories. In this political struggle, the industry is dominant because it is able to generate more information. It is able to do this because of its greater resources and its economic relation to the scientific superstructure which produces information related to pesticide safety and usefulness. This relation has been described by looking at pesticide safety testing, the agricultural colleges, and contrasting ideas about carcinogenicity.

Solutions. Finally there have been mentioned some possible solutions to the pesticide problem. It has been argued, however, that these solutions are not, at present, politically feasible. They are not feasible because, given the present public attitudes toward cooperation and the present level of understanding of ecological problems, they are unlikely to be seriously considered. A solution to the pesticide problem must await changes in public attitudes concerning cooperation and greater understanding of the nature, complexity, and potential seriousness of ecological problems. Many would argue that these causal factors are also related to other ecological and social problems. To the extent that this

is true, the pesticide problem will never be adequately dealt with by confronting it as an isolated question. It will be resolved in the context of confronting many issues.

NOTES TO CHAPTER VIII

¹The term "systemically" refers to thinking which conceptualizes causal factors in terms of broad social, economic or political variables. One holding a systemic perspective tends to look for causal explanations in long term, fundamental characteristics of the social system.

²U.S., Council on Environmental Quality, Integrated Pest Management, (Washington, D.C.: Government Printing Office, 1979), p. 107.

³U.S., Congress, Office of Technology Assessment, Pest Management Strategies. Vol. 1 (Washington, D.C.: Government Printing Office, 1979), p. 102.

⁴For a description of the amount of funds spent on IPM by various federal agencies see U.S., Congress, Pest Management Strategies. Vol. 1, p. 101. and Vol. 2, pp. 2-10. For an example of an argument calling for more funds see J. C. Headley, "The Economic Mileu of Pest Control: Have Past Priorities Changed," in U.S., Congress, House, Subcommittee on Natural Resources and Environment of the Committee on Science and Technology, Agricultural Productivity and Environmental Quality, Hearings. 96th Cong., 1st sess., 1979, p. 541.

⁵U.S., Council on Environmental Quality, pp. IX, XI.

⁶U.S., Congress, Pest Management Strategies. Vol. 1, p. 101.

⁷Act of November 28, 1975, Statutes At Large 89, 754 (1975).

⁸U.S., Council on Environmental Quality, p. 98.

⁹*Ibid.*

¹⁰*Ibid.*

¹¹This paragraph is based on U.S., Council on Environmental Quality, p. 98.

¹²U.S., Council on Environmental Quality, p. 98.

¹³U.S., Congress, Pest Management Strategies. Vol. 1, p. 6.

¹⁴U.S., Council on Environmental Quality, p. 97.

¹⁵Randall B. Ripley and Grace A. Franklin, Congress, the Bureaucracy and Public Policy (Homewood, Illinois: The Dorsey Press, 1980), p. 16.

¹⁶Theodore Lowi, The End of Liberalism (New York: W. W. Norton & Company, 1969). In particular see pp. 76, 125-156, 298.

¹⁷Morris P. Fiorina, "Control of the Bureaucracy: A Mismatch of Incentives and Capabilities," in The Presidency and the Congress, eds. William S. Livingston, Lawrence C. Dodd and Richard L. Schott (Board of Regents, The University of Texas, 1979), pp. 135-136.

¹⁸Fiorina, p. 136.

¹⁹Michael T. Hayes, "The Semisovereign Pressure Groups: A Critique of Current Theory and an Alternative Typology," The Journal of Politics 40 (February 1978): especially p. 120; Michael T. Hayes, "Interest Groups and Congress: Toward a Transactional Theory," in The Congressional System: Notes and Readings, ed. Leroy Rieselbach (Belmont, California: Duxbury Press, 1979), especially p. 260.

²⁰Hayes, "Semisovereign Pressure Groups," pp. 149-150; and "Interest Groups and Congress," p. 259.

²¹Hayes, "Interest Groups and Congress," pp. 259-260.

²²*Ibid.*, p. 260.

²³*Ibid.*, pp. 257-260.

²⁴Federal Insecticide, Fungicide, and Rodenticide Act, U.S. Code, vol. 7, sec. 136 (bb) (1976).

²⁵U.S., Congress, House, Subcommittee on Conservation, Energy and Natural Resources of the Committee on Government Operations, EPA's Implementation of the Pesticides Control Act, Hearings. 94th Cong., 2d sess., 1976, pp. 7, 8.

²⁶U.S., Congress, Senate, Subcommittee on Health of the Committee on Labor and Public Welfare, Preclinical and Clinical Testing By the Pharmaceutical Industry, 1976, Joint Hearings, Part III. 94th Cong., 2d sess., 1976, pp. 586-680.

²⁷Kenneth Entin, "Interest Group Communication With A Congressional Committee," Policy Studies Journal 3 (Winter 1974): 147-150.

²⁸Ibid.

²⁹Michael H. Best and William E. Connolly, The Politicized Economy (Lexington, Massachusetts: D. C. Heath and Company, 1982), pp. 118-120.

³⁰Ibid., p. 119.

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