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SOCIAL CHANGE AND THE UNIFIED SCIENCE PERSPECTIVE:
THE RESOURCE CONTROL MOVEMENT IN INDUSTRIAL SOCIETY

By

Kim Rodner

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ABSTRACT

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The dissertation comprises two distinct efforts. The first is strictly analytical and is concerned with clarification of a persistent theoretical issue. The second is empirical. It is concerned with the contemporary analysis of a social movement and a reconsideration of its historical presentation. The two ventures unite as the latter becomes didactic illustration of the former.

Contemporary controversy attests to the fact that an adequate theory of social (or cultural) change does not exist. Functional theorists have been frequently accused by conflict theorists of abetting such a lack. Neither group has produced a convincing conception.

The search for a theory of social change is fruitless because the problem itself is meaningless. It represents the revival, in the language of sociology, of the permanence versus change issue that perplexed the Pre-Socratic Greeks. A new approach is essayed. It is argued that the search for "laws of social change" or a "theory of social change" is initiated by virtue of the kind of language which the

sociologist employs in discussing his science. Functionalism represents one such language, conflict analysis another: neither, in and of themselves, are empirical theories. Instead they may be designated "meta-languages" in the sense that they may be used to discuss substantive theories. Because the former has stressed equilibriums, homeostases, boundary maintaining entities, and steady states it has introduced into the discussions of sociology a static overtone; and because the latter has stressed constraints, conflicts, and antagonisms it has introduced a changing or dynamic overtone. From such purely semantic errors arises the attempt to construct empirical theories. Yet no science of repute seeks theories of change versus statics (or as sociologists call it "control"). The confusion of our meta-languages in sociology entails us in a meaningless search.

An alternative path is urged and illustrated. If we adopt the mature meta-language of the majority of the sciences we immediately achieve clarity. This language is generally called the Unified Science Language and is the product of the combined efforts of empirical philosophers and scientists alike. By adopting this clarified language the problem of change versus statics dissolves.

To illustrate the analytical advance achieved by the *Unified Science Language* an empirical problem is explored.

Sociologists have made much of the fact that social movements involve change. By studying a significant social movement and discussing it in the Language of Unified Science the futility of a special search for laws of change becomes obvious.

Four types of propositions are amassed to explain the nature of the "resource control" or "conservation" movement in the United States, two of them empirical, two theoretical. First, original research was conducted to assess the impact of industrialization on the conservation movement. The forty-eight states were ranked in terms of resource relevant degrees of industrialization. They were next controlled for comparable amounts of "wild land" within their jurisdiction. From this a sample of comparable states with varying degrees of industrialization was selected. Questionnaires were administered to assess the "degree of rational resource control in public conservation agencies." A general correlation appeared between the level of industrialization and the rationality of resource control for states with comparable amounts of wild land.

This evidence was supported by three additional kinds of propositions: historical studies of the national conservation leadership; the theory of monopolistic capitalism; and organizational theory. These empirical materials plus

the general theoretical propositions were next cast against the traditional liberal-populist explanation of the conservation movement. Populist conceptions of the movement were challenged and liberal-populist ideology in the writing of conservation history argued. Such conceptions extend into political sociology on the one hand and the sociology of knowledge on the other.

Returning to the over-all problem, a brief outline of the key elements of the Language of Unified Science is presented. Next an analysis, in terms of the USL, of the resource control movement is offered as a didactic illustration of its power in handling the generalizations of science--without the introduction of pseudo-issues. The dissertation concludes with a brief consideration of similar problems elsewhere.

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"The rationale is that by getting positive answers to a series of small problems we will wake up some fine day with conclusive answers to the big problems. This hope can be a realistic one only so long as some connection between the little problems and the big ones is kept clearly in mind. When this connection disappears in the search for easy problems with conclusive answers, the result is merely the piling up of disconnected trivialities."

Barrington Moore, Jr.,

Political Power and Social Theory

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As Kenneth Burke once put it, I would like to thank a number of people "without whom not." In general I would like to thank the Department Chairman, Dr. John Useem and my dissertation committee, and to acknowledge the liberal intellectual possibilities within the Department of Sociology and Anthropology at Michigan State University, possibilities which provided me with a relaxed situation and a flexible program in which to work. If I took a bit longer to come around than others, I hope the reading I did in between will repay the patience that the Department extended. In particular I would like to give top plaudits to my dissertation chairman, Dr. James B. McKee. Our working relations have been virtually perfect, and with special reference to the analytical problem of this dissertation his observations and his interest in the sociology of confusion has been top rate. To Dr. Richard N. Adams must go my sincere thanks for his example as an indefatigable scholar, and for his fixing me with the cold eye of reason on a couple of occasions when I had convinced myself that the world had stopped running. Dr. William A. Faunce prodded me correctly on the vagueness of Weber's notion of rationality and on the specific empirical

design as well, I thank him for both. Dr. Jay Artis was kind enough to work in my behalf at milking the great Ford cow: if our efforts failed I am certain it was not his fault. Dr. William Form deserves credit for keeping me guilt ridden and for providing a model of what sociology should be: I thank him for both, even if my own efforts in no way compare. And to all other members, past and present, of the Department with whom I was fortunate enough to take courses or engage in conversation, my sincere thanks.

Outside the Department of Sociology and Anthropology, I would first like to acknowledge a key intellectual debt--however badly repayed--to the members of the Department of Philosophy at Michigan State University, and especially to Doctors Rudner, Zerby, Walsh, and Leonard. Perhaps I overestimate the contributions of analysis, but if so the meaning of a range of issues in the social sciences becomes extremely problematic. My thanks to the Philosophy Department for setting me right.

Another group of ideologists that have had an important role in the formation of this dissertation are the following conservation leaders and their colleagues around the country. My close friend Russell McKee gave me endless hours of conversation and quantities of information on the

structure and extent of conservation in the United States and in Michigan. Dr. Justin W. Leonard, Research Director, State of Michigan Department of Conservation deserves thanks for his instructive criticism and especially for his cooperation in the construction of the conservation questionnaire and the cover letter that accompanied it. I should also like to thank Dr. Norman Smith, Chief of the Forestry Research Division, State of Michigan Department of Conservation, for his vast knowledge and aid in the construction of the "wild land" control variable. To Professor Stanley A. Cain, Head, Department of Conservation, School of Natural Resources, University of Michigan must go acknowledgement for reiterating the classic liberal conception of the history of conservation. Doubtless I would have discovered the contradiction in my thinking myself, but Dr. Cain's remarks considerably shortened the process.

PREFACE

Those that read a preface expect to gain some orientation. The best orientation which I can supply to this dissertation is to note that it is really two studies instead of one. Since this is the case it should serve the reader's purpose to understand what each of these pursuits involves and why they have been placed under one cover.

The first concern is analytical. It is centered around issues that can be resolved only by clarifying the form of our discourse, the language we employ, and not, in fact apodictically not, in terms of empirical tests, studies, or examinations. Paradoxical though it may seem, I have long been convinced that much of the sterility of key aspects of modern sociology stems from a failure to conceive issues in any terms other than empirical. We have had too much of a good thing. We have stood, as though transfixed, before the altar of empirical evidence--never pausing to ask the crucial question: do our central questions have meaning, do they make simple semantic sense? With respect to the problem of social change, the search for a master theory of dynamics has gotten badly embroiled in verbal confusions. The work of sociologists (and anthropologists) in this area

should stand as a vast collective embarrassment. Instead it is still a central consideration attracting the energies of top flight people in the lodestone search for "the breakthrough."

Specifically this study (its first and last parts) approaches the question of a "theory of social (cultural) change" from the point of view of meaning. It does not ask: "what theory of change is correct?". It asks rather, what do we mean when we ask such a question, and what would such a theory purport to explain. And having asked that question it becomes pushy and disrespectful by arguing that we can give the idea of "change" no separate or distinct status, arguing that ultimately it is a pseudo-question. I come to this conclusion by showing that contained in the generalization (i.e., the correlations) of any science must necessarily (not probably) be contained a theory of change. And this is so, I argue, precisely because if we once have clearly in mind what science is, we also have clearly in mind that both permanence and change are simply ways in which we view the existing generalizations; change is the function of a perspective we bring to our materials. And as we shall note, there is nothing wrong with perspectives so *long*, and only so long, as they do not generate unreal *problems*.

With respect to a "theory of change" George C.

Homans and S. F. Nadel long ago recognized these fundamental facts. They were ignored. I have tried, in the pages that follow, to set forth the arguments against a search for a theory or theories of social change as well as the apparent reasons that so many sociologists have been captured by an ingenuine issue.

The second concern of this dissertation is empirical. It centers on an explanation of the social bases of the conservation movement in the United States. Conservation, or the control of resources, when viewed as a social movement can tell us something about the structure of industrial societies within the framework of democratic-market political economies. In its own right an exploration of its causes and consequences seems justified. And this justification is more apparent as we realize the implications which new data and the analysis of old materials promise to confer. The conservation movement was, after all, one of the more significant domestic events of the era just preceding World War I, the era historians generally refer to as the "age of reform" or more specifically as the "populist-progressive era." Since conservation is central to this important phase of American history it is not surprising that new findings and there-examination of old ideas connected with

this period should have implications beyond conservation and resource matters alone. In particular political sociology and the sociology of knowledge both stand to gain from any review of the age of reform. Nor can it well be otherwise once we grant that American liberalism finds its roots in the populist revolt, and later in the New Deal, the latter which, for all of its newness and in spite of massive and often incredible contradictions in its own credo, viewed itself as a fulfillment of the nineteenth century liberal creed. If today American liberalism seems hopelessly caught in the contradictions of its own past, and often incapable of extracting itself from the semantic confusions of its own apologists, perhaps what we are witnessing is the agony of an ideology becoming aware that in its past there is a lie. This lie may be particularly telling with respect to one of American liberalism's most important tenets, i.e., the liberal conception of domestic policy, particularly as it relates to resources and conservation.

Beyond exploring contemporary materials on the nature of the resource movement we shall have an opportunity to draw together a variety of additional propositions (some empirical, some theoretical) that will bear on the nature of conservation history and on conservation's present status. As a group these propositions seem to me crucial for the assessment of

the movement itself and the kinds of history that have been written about it. They are also crucial for the meaning of liberalism in its genesis as well as its meaning today. Therefore, insofar as they pressure a review of the social sources of conservation history and urge further consideration of the political situation of early liberalism they constitute an essay in political sociology; and insofar as this intelligence calls into question the motives and the ideology of conservation historians it constitutes an essay in the sociology of knowledge. Both may be more fully explored at a latter time and by different methods, yet in this dissertation it is hoped a basis for such exploration will have been indicated.

But beyond this strictly empirical concern is a larger significance. The study of social movements is closely linked, in the literature of sociology, with the genesis of social novelty, i.e., with social change. Surely, if there is anything to the claims of social change theorists this should be a rich area for investigation.

By using the conservation movement as a concrete illustration I will first attempt to explain it as an empirical phenomena. We will find that such an explanation will result in a scientific law, i.e., a generalization. It will then be my task to demonstrate that this simple

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generalization (or correlation, as you wish) is more than sufficient to account for the "changes" that have taken place in society with regard to resource disposition and control. In other words, the empirical study will serve as an illustration of a formal or analytical problem. Ideally each investigation may be kept distinct, but illustration may bring the argument home with added force.

Sometime it might be interesting to write a "natural history of pseudo-problems"; one would have to cover much of human intellectual history. And while it might at first glance appear negative and testy, on closer examination it should be doubly instructive but much more difficult to write and to read than the history of man's positive intellectual achievements. Certainly such a history is overdue in sociology and the social sciences generally. It could serve as a handbook in the analysis of man's semantic delusions. One might even consider this dissertation as a small first essay in a collection to come.

TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS	iii
PREFACE	vi
 Chapter	
I. THE POVERTY OF SOCIAL CHANGE THEORY	1
II. THE EMPIRICAL PROBLEM: RESOURCE CONTROL MOVEMENT	18
Chief Features	18
History and Hypotheses	25
Empirical Research Design	74
III. EMPIRICAL DATA AND INTERPRETATION	101
Data on State Park Systems	102
Data on Industrial Society	105
Data on Wild Land Variable	143
Data on Institutionalization of Rational Resource Control	152
Data on Taxation	189
Conclusions: The Nature of Resource Control	194
IV. UNIFIED SCIENCE, SOCIAL CHANGE, AND THE MOVEMENT	201
V. CONCLUSIONS: PROBLEMS AND PSEUDO-PROBLEMS . .	224
BIBLIOGRAPHY	228
APPENDIX: LIST OF SURVEYED STATES AND STATE CONSERVATION ORGANIZATIONS	240

LIST OF TABLES

Table		Page
1.	Rank order of number of acres in state parks, by states, together with annual visits and annual expenditures, 1959	103
2.	Rank order of states "highly industrialized," "moderately industrialized," and "least industrialized" as summarized for all industrial society indicators. States ranked by the total number sub-indicators falling into each third of the total rank order. Table excludes states exhibiting random variation	107
3.	Number of business establishments by employees size of 500 and over (1959) ranked by states, and ratio of establishments 8-19 employees to 500 and over employees. (Ratios computed by author)	111
4.	Gross assessed value, by states, of locally assessed taxable real property 1956: commercial and industrial property, in rank order	113
5.	Ranked percent of <u>total</u> population in non-agriculture workforce (annual average), for 1960. And percent of workforce in primary (extractive) and secondary (manufacturing) as opposed to tertiary (service) industries (computations by author)	115
6.	Rank order, by states, of total number of cities of 50,000 population and over, together with breakdown, by states, of cities falling within each of the following ranges: 50,000-100,000; 100,000-250,000; 250,000-500,000; 500,000-1,000,000; 1,000,000 and over (1960)	118

Table		Page
7.	Rank order of number of Standard Metropolitan Statistical Areas (1960), by states. And percent of total population residing inside SMSA (computed by author). (Overlapping SMSA counted for all states)	120
8.	Percent of total population classified as "rural," by 1960 census (computed by author), rank order by states	123
9.	Water use by municipal systems per day (1954), by states (in 1,000,000 gallons), in rank order	125
10.	Municipal sewage loads (1954) in continental United States, by states [in terms of equivalent population], in rank order . .	128
11.	Total population, by states, 1960, in rank order	130
12.	Automobile registrations, by states, 1960 (in thousands), by rank order	132
13.	Rank order by states of absolute number of residents (15 years and older) buying fishing licenses, together with percent of resident population (15 years and older) buying fishing licenses and non-resident fishing licenses sold, as percent of resident	135
14.	Rank order by states of absolute number of residents (15 years and older) buying hunting licenses, together with percent of resident population (15 years and older) buying hunting licenses and non-resident hunting licenses sold, as percent of resident	137
15.	Per capita personal income, by states, 1960, in rank order	139
16.	Absolute acreage in "wild lands," by states, circa 1954-59, as control factor	145

Table		Page
17.	Continuum No. 1. Summary table of institutionalization of rational resource control sub-indicators of nine states ranked by degree of industrialization	158
18.	Continuum No. 2. Summary table of institutionalization of rational resource control sub-indicators of five states ranked by degree of industrialization . .	162
19.	Continuum No. 3. Polar extreme summary table of institutionalization of rational resource control sub-indicators of six states, occurring as three pairs occupying extreme positions with respect to degrees of industrialization	166
20.	Rank order of states by relation of general revenue of state and local governments to personal income (1957)--general revenue per \$1,000. of personal income. Federal revenues of states per \$1,000. of personal income (1957). And state per capita amounts of all general revenues (including federal--1957)	192

LIST OF FIGURES AND APPENDICES

Figure	Page
1. Income, travel, and leisure factors affecting the use of outdoor recreation facilities for the period 1850-2000 . . .	142
APPENDIX: LIST OF SURVEYED STATES AND STATE CONSERVATION ORGANIZATIONS	240

CHAPTER I

THE POVERTY OF SOCIAL CHANGE THEORY*

Sociology's gadfly, Pitirm Sorokin, once remarked that there was as little justification for studying small groups in sociology as there was for studying small plants in botany. Whether or not he was right about small groups it is certain that a similar argument will stick for the study of social change. Change, as a distinct focus, a topic, or a field of investigation is as unwarranted a pursuit as its opposite number, order, cohesion, permanence, equilibrium, homeostasis, or the steady state. And the search for laws of change or statics is therefore also unwarranted. Yet one need examine only a small portion of the periodical or hardcover literature in sociology to establish the fact that a large amount of time and energy is being spent precisely

*The footnotes contain the majority of the works directly relevant to this dissertation. I have attempted to restrict the citations to a reasonable number, yet at the same time it is important to flesh out the study with a variety of opinion and historical reference. In fact, the reader may expect to find in these notes a considerable amount of material that points to wider and more stimulating horizons both in American historiography and in sociological theory. In a sense the text itself is the bare outline of the personal and scientific interest in change and the conservation movement.

on this task. So frequent are the references to this problem, and so filled with self-flagellation the statements of failure, that one is tempted to speak of a "literature of frustration."¹ The net result is a series of tours de force

¹The "literature of frustration" flowing from the functionalists is impressive. The following citations are not intended to be exhaustive, but they are representative.

Beginning outside of sociology we find an economist with sociological interests at M.I.T. recently making this comment: "If sociologists are to analyze change in a society as a whole, rather than merely to describe it loosely, they must go beyond models in equilibrium and construct models involving dynamic processes," Everett E. Hagen, "Analytical Models in the Study of Social Systems," American Journal of Sociology, Vol. LXVII (September, 1961), p. 150. From an eminent political scientist of the functional variety, this call to danger: ". . . we need a set of abstractions which will help us find our way through the exciting multiplicity and complexity of change (p. 3). The analysis of change is always precarious and, for that reason, one of the most taxing of man's urgent tasks (p. 5)," David E. Apter, The Political Kingdom in Uganda (Princeton University Press, 1961). Don Martindale in Social Life and Cultural Change (D. Van Nostrand Co., Inc., 1962) spends some pages examining the functionalists (and others) inability to handle social change: "Talcott Parsons, who has grown restive under the frequent observation by contemporary critics that functionalism has troubles with its theory of social change, undertook in his sections of Theories of Society to develop the functionalistic theory of social change (pp. 26-27)." The result, Martindale argues, is last year's menu warmed over: "By way of a series of euphemisms Parson has taken this very step; he has refurbished social evolutionism (p. 27)." Unfortunately Martindale does no better himself; in fact his entire book is a testimony to the superfluity of the concept. So far as I can determine all Martindale adds is the word "change" to an otherwise fascinating and quite impressive series of studies in the structure of several societies, mostly ancient. These studies, centering around the role of intellectuals, constitute a series of generalizations; as such the addition of the word change to their exposition is most incredible. A

rose is a rose by any name. So far as I can determine the source of much of the anguish over change dates from Talcott Parsons comment: "It is a necessary inference from the above considerations that a general theory of the processes of change of social systems is not possible in the present state of knowledge. The reason is very simply that such a theory would imply complete knowledge of the laws of process of the social system and this knowledge we do not possess." The Social System (The Free Press, 1951), p. 486. Bernard Barber arguing in the context of a specific sociological area says in Social Stratification (Harcourt, Brace & Co., 1957), p. 479, "With the present limitations upon our social-science knowledge, it is easier to recognize the fact that one type of stratificational structure or process has changed into another than to analyze precisely how the change occurred." And a bit later on p. 480, "What we need, in addition to further understanding of the dynamic processes in each part of society, is a theory of social change that will view society as a relatively unified system in which various parts are reciprocally affecting one another." Walter Buckley in an article in Howard Becker and Alvin Boskoff's Modern Sociological Theory (Holt, Rinehart & Winston, Inc., 1957), entitled "Structural-Functional Analysis in Modern Sociology," pp. 236-59, makes this comment on p. 245, ". . . how can functionalism account for the fact that specific social systems do not survive--that change seems as basic as stability." Marion J. Levy, Jr. in The Structure of Society (Princeton University Press, 1952), changes the stress but poses the same problem as Parsons had voiced: "There is, therefore, a sense in which some static analysis is logically prior to dynamic analysis, or is at least extremely helpful for it. Structural-functional requisite analysis is one systematic way to develop static theories that may have such uses" (p. 45). A. R. Radcliffe-Brown in A Natural Science of Society (The Free Press, 1948), pp. 80-89, makes the same point. Brown distinguishes among: kinds of societies, how they persist, and how they change their type. On p. 89 he argues that: "The first major task of analysis I conceive to be the synchronic study of society. Such an analysis is more fundamental than a diachronic one." Or again on the same page: "'We say: Let us take a society and consider it as though it were merely persistent, without change.' If we do not do that, we cannot arrive at generalizations as to how societies change. It is logically of the very essence of things that we shall be able to make that discrimination." Charles P. Loomis in Social Systems (D. Van Nostrand Co.,

Inc., 1960), attempts to build units into his conceptual scheme that will obviate the difficulty of handling change in an equilibrium model. In doing so he fails to realize that the difficulty is not substantive but formal (as we shall see). "It is in an effort to break through some of the difficulties imposed by the static aspects of the equilibrium model in the analysis of social change that this model is presented [the PAS model]" (p. 10).

Awareness of the impasse on change has become so great that Parsons has taken to answering his critics. In a rejoinder to Gross' lead article in a recent issue of the *AJS*, op. cit., p. 139, Parsons argues that some work is being done to rectify the hiatus in his system and others. He points to Neil J. Smelser, Social Change in the Industrial Revolution (University of Chicago Press, 1959), as an example of this effort. There is no question that Smelser makes a valiant attempt to solve a problem of some importance to the functionalists. As we shall see language can be used to accommodate any issue if only we have the patience to work and rework it to fit our needs. What is really amazing is that at least two important figures in contemporary social science, both generally classified as functionalists, had rejected the very meaningfulness of the problem at about the time Parsons first published his The Social System. Whether it was a fluke that they were ignored, or whether, as seems more likely, Parsons' authority carried the day, is not altogether clear. Their arguments are virtually identical to mine though much truncated and perhaps too brief to seem important. In The Human Group (Harcourt, Brace & Co., 1950), pp. 449-52, George C. Homans put it this way:

"In studying social change, we discovered no new hypotheses. What we did was watch how a change in value of the elements effects changes in the values of the others. When we say that a decrease in the number of activities a group performs brings about a decrease in the frequency of interaction between the members of the group, we are stating no new hypothesis; we are studying changes in values of elements entering a hypothesis we already know. We are studying dynamics." (p. 450).

"But when we say that in studying social control and social change we have learned nothing new, we are not trying to turn our science into dust and ashes. What we have said is that the phenomena of social statics, social control, and social change can be stated with more simplicity, elegance, and insight when they are considered to be contained by

designed at overcoming a problem that does not exist, and a voluminous body of research answering to no need but that of Mill's "higher ignorance."²

implication in a single series of hypotheses" (p. 451).

And S. F. Nadel in Foundations of Social Anthropology (The Free Press, 1951), pp. 100-106, makes the identical point:

"The processes and connections so elucidated give us no 'laws of change'; at least they give us only laws governing changes in determinate social phenomena. That is, they define the 'invariant relations' between such-and-such institutions, groupings, and so forth; and this is what any 'social law' does" (p. 102).

Nadel was familiar with the alternative meta-language I am going to propose and thus he never fell into the trap of the functionalist vocabulary; Homans missed it by simple native wit as far as I can see. Yet it is surprising how little their contributions have been appreciated. I came to my own conclusions before re-reading either of these men, which speaks well for simultaneous invention hypotheses even if the substantive meaning is ignored.

²C. Wright Mills, whether in bad taste, as Lipset suggests, or not, first employed the phrase "higher ignorance" to characterize the work of functional theorists in his "Introduction" to The New American Library's edition of Thorstein Veblen's The Theory of the Leisure Class, 1953. He expanded the argument in his Sociological Imagination (Oxford University Press, 1959), but the early statement is still the most direct:

"The Grand Theorists, on the other hand, represent a partially organized attempt to withdraw from the effort plainly to describe, explain, and understand society: they verbalize in turgid prose the disordered contents of their reading of eminent nineteenth-century sociologists, and in the process mistake their own beginnings for a finished result.

"In the practice of both of these leading schools [the "Higher Statisticians" being the other school] contemporary Social Science becomes simply an elaborate method of insuring that no one learns too much about man and society, the first by formal but empty ingenuity; the second, by formal but

Before supporting these statements it seems best to examine the general issues involved. The problem of change and statics in social phenomena is closely--though not exclusively--related to fundamental ideas of the functionalists on the one hand and the conflict theorists on the other. While today the former is indeed the sociological orthodoxy there is afoot a growing revolt. Dahrendorf and Coser, to mention only two, have vehemently argued for an organized uprising against Utopia, and even some of the utopians have been struggling to activate their constructs.³ The fact

cloudy obscurantism.

"The work of Thorstein Veblen stands out as a live protest against these dominant tendencies of the higher ignorance" (p. 5).

³ Ralf Dahrendorf has recently argued that the changeless structural-functional perspective is utopian, not in the sense of being an unrealistic projection of certain desired social values, but in the sense that utopias are by definition un-changing societies. See his able presentation in "Out of Utopia: Toward a Reorientation of Sociological Analysis," American Journal of Sociology, Vol. LXIV (September, 1958), pp. 115-27. More recently see Ralf Dahrendorf, Class and Class Conflict in Industrial Society (Stanford University Press, 1959), for a full scale review of the battle of the functional-conflict perspectives. Other enemies of utopia and contemporary supporters of conflict include: Lewis A. Coser, The Functions of Social Conflict [this title is a study in paradox] (The Free Press, 1956); Morris Janowitz, "Military Elites and the Study of War," Conflict Resolution, Vol. I (March, 1957); also see the same writer's The Professional Soldier (The Free Press, 1960); most of the work of C. Wright Mills is generally--though not universally--included in the conflict camp. There is, of course, a larger body of "conflict-type" literature in modern sociology than I could begin to explore in a footnote. For a review

that men, living in the twentieth century, are still exercised over a Pre-Socratic problem of the fifth century, B. C., is a striking comment on certain features of our science. Parmenides and Heraclitus are still with us in the language of sociology.

The "change problem" is the crux of the matter for both theoretical perspectives. For the functionalist it is the problem to solve. For the conflict analyst it is (supposedly) the problem he has solved--though now the nemesis of conceptualizing permanence or stability arises.

In their concern with change both functionalist and conflict theorists--though they appear not to realize it--are in the thrall of a pseudo or semantic problem. The issue is unreal, resulting from the ambiguity and kinds of perspectival biases into which their vocabularies lead them.

This is not the first time in a science that men concerned themselves with unreality.⁴ Yet this unreality is

of the contest between the two camps Lipset has a few good paragraphs--though I cannot buy his conclusions--in his review of Moore's book (Political Power and Social Theory: Six Studies, Barrington Moore, Jr., [Harvard University Press, 1958]) in the American Sociological Review (April, 1960), pp. 283-85. For still another approach focused at the level of organizational theory (a level at which the same conflict-functional battle rages) see: Eugene Litwak, "Models of Bureaucracy Which Permit Conflict," American Journal of Sociology, Vol. LXVII (September, 1961).

⁴By "un-reality" I refer not to false theories such as the Ptolemy theory of the solar system or the Rutherford

all the greater because in and of themselves neither functional nor conflict theory are really theories at all. In their pure form they make no assertions about the actual linkages or relations of the empirical world. In no way do they "restrict the framework of possibilities"--the basic requirement of any empirical theory.⁵ If one reflects on the issues carefully it is soon apparent that the two theories are languages about science rather than of science. To speak of systems of functional relations (or conflict, constraint, and antagonism) as the manner in which the world is ordered is not to talk about actual empirical interrelations. Rather, it is a language with which one may discuss what is discussed

atomic model, I mean, instead, problems in science that rest upon semantic and linguistic inadequacies such as the Newtonian conception of space and time (commented on below, pp. 224-25) and G. E. Stahl's eighteenth century phlogiston theory of combustion and calcination of metals. This particular theory in chemistry depended ultimately upon what the investigator meant by a "scientific proposition," for if they were willing to entertain "negative weights" and non-detectable substances then the empirical criteria of science vanished (i.e., the rules of the game were altered). The same question of meaning faces us in the change issue: either we mean by change something frightfully common or the discourse we engage in is meaningless. For discussion of the phlogiston theory see: A. R. Hall, The Scientific Revolution 1500-1800 (Longmans, Green & Co., 1954), pp. 326-36; also, Herbert Butterfield, The Origins of Modern Science (The Macmillan Co., 1952), pp. 152-63.

⁵ Thus: "Any synthetic proposition [empirical proposition]--affirmative or negative--is a restriction of the frame of possibilities; as a determination it excludes other determinations." Felix Kaufmann, Methodology of the Social Sciences (Oxford University Press, 1944), p. 20.

in actual empirical situations.

Take the concept "functional system." One may argue that the proper scientific perspective is to see the social world as a system of interconnected self-regulating units. The idea of such functionally interacting and self-regulating systems is often used to discuss certain classes of events: organisms, groups, societies. To talk this way is common enough, but in all cases it is not a discussion of the world "out there" but of how we wish to view the world.⁶ The same may be said for conflict analysis. For this reason many functionalists and conflict theorists choose, when talking about their general theoretical perspectives, to append the word analysis or model to the two pursuits. This gives

⁶That functional-conflict vocabularies are not the necessity of a restriction of the frame of possibilities, not "stubborn and irreducible facts" of nature, not "out there" in the world, but that they derive from our perspectives and interests is nicely demonstrated by Ernest Nagel in, among other writings, "Teleological Explanation and Teleological Systems," Readings in the Philosophy of Science, Herbert Feigl and May Brodbeck (eds.) (Appleton-Century-Crofts, Inc., 1953), pp. 537-58. There are several other excellent presentations which arrive at exactly the same conclusions. See, for instance: Richard Bevan Braithwaite, Scientific Explanation (Cambridge University Press, 1953), pp. 319-41; for a popular treatment many of the same issues are reviewed in Hans Reichenbach's The Rise of Scientific Philosophy (University of California Press, 1951), pp. 191-214. Finally, in a book with sociology as its chief concern, Illewellyn Gross, Symposium on Sociological Theory (Row Peterson and Co., 1959), see the functionalism-deflating article by Carl Hempel, pp. 271-307.

formal recognition of the ontological differences existing between actual empirical theories and certain kinds of languages with which we discuss empirical theories.⁷

Now, so as to make the issue perfectly clear, it should be noted that when a functionalist or conflict theorist analyzes any specific empirical proposition in which he, (a) makes an empirical assertion in the vocabulary or language of, (b) functional or conflict analysis, he will in fact be making empirical claims as well as analytic ones. But here I am discussing only the type of theory building and debate that is carried on when functionalism and conflict perspectives are considered in and of themselves.

At this most general (and ontologically distinct) level, functional and conflict analysis are languages about actual theories in sociology. They provide us with a vocabulary and something of a syntax by which we may discuss the venture in which we are engaged. And if we think of actual empirical theories as the "language of science" itself, then functional and conflict theories are "meta-languages." And since, in turn, these meta-languages contain

⁷ See, for instance, Robert K. Merton, Social Theory and Social Structure (The Free Press, 1957), pp. 19-33; Marion J. Levy, Jr., The Structure of Society, op. cit., 1952, pp. 27-110; Ralf Dahrendorf, "Out of Utopia," op. cit.

perspectives and residuals (such as the change and permanence bias) we may call them "perspective theories."⁸

Therefore, I shall use the phrase "perspective theory" to designate any meta-languages in science; and I shall use the phrase "substantive theory" to designate any actual proposition expressed as a statement about empirical connections or correlations in the world. In sociology all statements about actual relations in the social world are substantive theories (if they are extremely specific the term "law" or "generalization" may be preferred). And in sociology all statements about statements of actual empirical connections are perspective theories and therefore meta-languages. They are languages about the actual propositions of scientific discourse.

Two facts about perspective theories or meta-languages stand out. First, no science can exist without such linguistic devices beyond the primitive formulations of its earliest folk discoveries. Scientists have to talk about what they are doing as scientists, not just about what they are studying in particular. Second, meta-languages or

⁸ Llewellyn Gross, with whom I can agree on virtually nothing, in a recent article does catch an aspect of the meaning I have in mind when I use the phrase "perspective theory." See: "Preface to a Metatheoretical Framework for Sociology," American Journal of Sociology, Vol. LXVII (September, 1961), p. 126.

perspective theories are not only necessary but they must be judged as adequate or inadequate.⁹

As regards the first point, the history of empirical investigation bears ample evidence that when science gets beyond its earliest collecting or natural history stage, scientists themselves, as well as educated laymen, reflect not only on its particular laws or theories descriptive of connexity in the world, but they also discuss what this connexity amounts to in general. Sociology is no exception; the debate on such issues fills the pages of much late nineteenth century and twentieth century social thought.

Regarding the second point, the adequacy of perspective theories or meta-languages, more needs to be said. The test of any symbol systems is its effectiveness for the purposes at hand. The test of scientific meta-languages is the degree to which they facilitate understanding and clarify the structures of scientific knowledge. Since meta-languages are

⁹There exists a large and fructifying literature which is concerned with logical analysis of science. All general treatments of the subject make both points of this paragraph: the necessity of contextual, perspective, or meta-linguistic devices and the need to constantly examine their utility. In sociology see: Llewellyn Gross, Symposium on Sociological Theory, op. cit.; in philosophy see, for instance, Richard B. Braithwaite, Scientific Explanation, op. cit.; Ernest Nagel, The Structure of Science (Harcourt, Brace & Co., 1961); and for a non-technical treatment see Hans Reichenbach, The Rise of Scientific Philosophy, op. cit.

super-empirical they cannot be judged by empirical predictionist results. They can only be judged by how well they facilitate advance in empirical matters by clarifying, explicating, or aiding the understanding of scientific meanings.¹⁰

Now what I am going to argue is that the perspectives overwhelmingly current in sociology today--functional orthodoxy and conflict heterodoxy--are vague, ambiguous, and productive of pseudo-conceptualizations, such as the change and statics issue. What I shall propose, and this is clearly a strategic recommendation, is that we already have at hand a vocabulary or meta-language which has a long history of usage, has been carefully researched and explicated by men eminently capable of meaning analysis, and is at present the perspective theory--or can easily translate the perspective theory--of every major science. It is therefore a meta-language with clarity, precedent, and consensus standing in its favor. It is a tool purged of ambiguity and perspectival bias, vigilantly

¹⁰ Strictly speaking this last paragraph is an overstatement. Meta-languages are judged by their success; this itself constitutes an inductive generalization (i.e., of the form "All A is B": "the USL [see below] has clarified issues in these instances, therefore it will clarify issues in other instances"). Some might argue that because the induction is drawn with regard to a symbol system that it is a weak form of induction. I see no difference in principle, but in practice this criterion is often applied inconsistently to linguistic formulations.

watched by its explicators for semantic fallings from grace, and admirably suited for scientific discussion.

I shall not argue that conflict and functional perspectives cannot be twisted and hammered into equal clarity and usefulness if we wish to spend the time and effort. Any language can be re-defined and organized to do nearly any job. But I shall argue that if this were done it would simply duplicate the effort already on hand, ignore a useful division of labor, and accomplish all this at considerable cost. This last estimate seems justified judging from the present confusions of current perspective theories in sociology. It also seems justified, when one views the long history of clarification which this dominant language in use in empirical science today had to undergo to attain reasonable clarity.

The meta-language I have in mind is generally referred to as the Unified Science Language (or vocabulary) hereafter abbreviated as USL. Use and wont are the main considerations in recommending this language, and results in application can be the only criterion of success. The language that allows one to talk about science with the least confusion, the language whose adoption results in the broadest inter-science communication, the language that originates the

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smallest number of pseudo-problems (i.e., semantic problems)--
that is the language any reasonable person must recommend.¹¹

¹¹The use of the Unified Science Language is extremely widespread, being roughly coterminous with the present day language of the philosophy of science in philosophy and the work of several scientists concerned with issues of analysis and semantics. See for instance:

Richard B. Braithwaite, Scientific Explanation, op. cit.; Ernest Nagel, The Structure of Science, op. cit.; the old standby, on which Nadel and several other social scientists were trained, Morris R. Cohen and Ernest Nagel, An Introduction to Logic and Scientific Method (Harcourt, Brace & Co., 1934)-- still in print and still very useful; at least, so far as I can determine, it is the book that kept Foundations of Social Anthropology off most, if by no means all, the semantic reefs; Otto Neurath, Rudolf Carnap, and Charles W. Morris (eds.), International Encyclopedia of Unified Science (University of Chicago Press, 1955) (any and all of volume one--both parts--and completed parts of volume two); Ernest Nagel, Logic Without Metaphysics (The Free Press, 1956); Herbert Feigl and May Brodbeck, Readings in the Philosophy of Science, op. cit.; Herbert Feigl and Wilfrid Sellers, Readings in Philosophical Analysis (Appleton-Century-Crofts, Inc., 1949). For simplified accounts see: Norman Campbell, What Is Science (Dover Publications Inc., 1952); Hans Reichenbach, The Rise of Scientific Philosophy, op. cit.; Stephen E. Toulmin, Philosophy of Science (Hutchinson, 1953); A. Pap, Elements of Analytic Philosophy (Macmillan and Co., 1949); and articles in several journals, especially the journal of the Philosophy of Science.

The USL is not alone the effort of philosophers; quite the contrary, numerous scientists have contributed to its formation and clarification. Among famous scientists that have helped in the formation of this meta-language are: Albert Einstein, Philipp Frank, Henri Poincaré, Ernst Mach, Percy W. Bridgman, Pierre Duhem, Norman Campbell, Oscar Lange, Eugene P. Wigner, Theodore Abel, B. F. Skinner, Egon Brunswik, Felix Mainx, Joseph Woodger, Edgar Zilsel and however one wishes to classify them Bertrand Russell, John Dewey, Charles Sanders Peirce, Rudolf Carnap, and Carl G. Hempel.

For a general introduction to the aims, methods, and brief historical review of the USL see: Otto Neurath's essay in the International Encyclopedia of Unified Science, Vol. I, op. cit., pp. 1-27.

Such a language is the USL. Such is not the language of functionalism or conflict analysis, as witnessed by the continuance of a two-thousand five-hundred year old problem that no other science or discipline finds worthy of a moment's consideration. Pragmatic utility becomes the final arbiter; meta-languages are neither wrong nor right; they either aid or they inhibit communication.

Now were clarification and meaning analysis my sole concern, were the only interest that of establishing an analytic point, mainly, that some languages work and others do not, or do so less effectively, then I might (a) develop comparative analyses of the respective languages, (b) point out the issues of confusion, and (c) end the matter with a recommendation, based upon degree of clarity and extent of usage, of some one meta-language. In other words I might engage in logical analysis as a pursuit in itself.

There is however a pedagogical advantage in pursuing another strategy in making the point. If logic alone convinced, the task would soon be completed. But not only has logic often failed to dislodge entrenched ideas, it is often frowned upon by American sociologists. Perhaps the German experience or the American idiom are to blame. At any rate another approach seems both more likely to instruct, more interesting to read.

By selecting an empirical problem of some scope and complexity which is generally agreed to involve social change--the chief artifact of confusion generated from sociology's competing meta-languages--and subjecting it to interpretation in the USL, I may be able to demonstrate with added force the meaningfulness of the argument.

Thus about the analytic problem I can afford to be reasonably certain, for that analysis is completed and ready to present. About the empirical problem the reader may judge for himself. When put together the two approaches should have maximum expository effectiveness. Ideally either pursuit is independent of the other (and may be so treated), but together they have the pedagogic advantage of going beyond the possibilities of either one alone. Science requires both pursuits: concept clarification or analysis and empirical investigation. This thesis will involve both approaches.

The next task is to select an empirical problem that is significant and about which there is consensus regarding the problem of change.

CHAPTER II

THE EMPIRICAL PROBLEM: RESOURCE CONTROL MOVEMENT

Chief Features

By common consent the area of sociological investigation pre-eminently concerned with social change is collective behavior. This is particularly true if we avoid the social psychological aspects of the field and concentrate on the institutional and organizational problems. And within the area of collective behavior social movements are generally conceded to involve the apotheosis of social novelty. Therefore, the most likely area for the location of my empirical problem should be in the area of social movements.

However, in terms of focus, I prefer to organize my work around the study of industrial society.¹ This has

¹There are, it seems to me, two mutually related ways of viewing sociology. On the side of conceptual formations sociology has been concerned with a limited but important set of social realities that other social sciences have ignored or given only slighting attention: collective behavior, socialization, primary groups, associations, stratification, population and ecology. In using these concepts a wide diversity of special sociologies have emerged (military, religious, political, urban, etc.). On the other hand much of this work has been located in industrial society and to a lesser extent historical societies. It depends on the kind of questions one asks as to which focus will prove most

clearly been either the chief unit of analysis or the laboratory in which the sociologist has labored so assiduously. Therefore, my focus will be on a social movement, but with no intention of studying social movements as such. The "social movement" is a useful concept for understanding or studying certain features of industrial orders. Thus, while drawing on the area of collective behavior and the sub-field of social movements, I can hope to develop a fuller understanding of the social nature of the industrial process under selected conditions.

The social movement I wish to study may be called "the resource control movement," and because the interest is in industrial society I shall call the venture The Resource Control Movement in Industrial Society.

I believe that the one significant method of studying industrial society is by use of the comparative method, as Lipset, Bendix, Form, Miller, and others have demonstrated.² But to construct a comparative research

useful. Sociologists and social thinkers as much (if not more) concerned with industrial society as with the concepts include: Alexis de Tocqueville, Karl Marx, Max Weber, Thorstein Veblen, Karl Mannheim, Robert Lynd, C. Wright Mills, Reinhard Bendix, Barrington Moore, Jr., Seymour M. Lipset, Robert Bellah, William Kornheuser, Juan Linz, Clark Kerr, William Form, Daniel Bell, Ralf Dahrendorf, and Don Martindale

² Seymour Martin Lipset has conducted several studies employing the comparative context of industrial society; see:

design for industrial societies requires that the variable being correlated with industrialism be fairly well researched in some specific societies, thus assuring the construction of plausible hypotheses. This is especially the case regarding the "resource control movement." The exhortations and admonitions about resource control are many, but the scientific research into its social basis is lacking. Therefore, in focusing on one industrial society I hope, at this juncture, to gain the greatest tactical advantage.

Still believing that the comparative method offers richer possibilities than a case study, the logical focus should be a comparative analysis of the movement within the industrial society selected. This will be my concern in this dissertation.

The industrial society selected is the United States, and the comparative units of analysis the forty-eight states. This should have the advantage of significant scope and at

Political Man (Doubleday & Co., Inc., 1954), esp. pp. 45-96; Reinhard Bendix--who incidently defines sociology as the study of industrial society--in his Work and Authority in Industry (John Wiley & Sons, Inc., 1956) uses a comparative method with notable results in studying East-West sources of industrial discipline; large scale comparative analysis of survey research and a limited study in depth afford the methodology for the joint authors' Social Mobility and Industrial Society (University of California Press, 1959); William H. Form and Delbert C. Miller, Industry, Labor and Community (Harper & Brothers, 1960), which uses a comparative industrial community design.

the same time a numerically extensive comparative base. What I shall try to show is the existence of a directly proportionate relationship between the two variables of resource control and industrialism--conceived broadly as a societal phenomenon--within the context of the United States.

But a further limitation is in order. Since enough information is already at hand to support the contention that industrialism is not the only variable to consider in the matter of resource use, it is important that two factors be controlled. There seems to be some sort of clear relationship between political and economic institutions on the one hand and resource control within the industrial setting. We have, therefore, an additional advantage in selecting the United States with its forty-eight continentally contiguous units. For in this setting we already have virtual control of the political and economic institutions. As a spontaneous development, socialistic or politically authoritarian systems, whether fascist or communist, are clearly of significance to the resource movement. With forty-eight homogeneous states this aspect of the movement may be ignored.³

³The significance of such social structures stems from the obvious fact of planning and centralization of authority which socialistic and totalitarian systems contain, the former in the economic system, the latter in the political system (if the distinction is meaningful). The emergence of social movements such as conservation seem, to me, to represent a

The issue then is: what is the "resource control movement?" By "movement" I understand a "social movement" with the characteristic features of development from spontaneous crowds and publics into, in this case, an organized and institutionalized feature of social structure. And that with this transition from ill-defined spontaneity to social structure a series of alterations or changes result that had not occurred before the social movement's existence. By resource control I understand all attempts, whether by exhortation, by individual effort, by public protest, or by highly organized and institutionalized administrative action to designate the rational utilization of culturally defined natural resources. The only exception to such designation will be soil and agriculture control, and this for reasons apparent below.⁴ The term "conservation" might

distinct substantive class. Such movements make sense only in pluralistic and relatively decentralized types of social structure. Certainly it is difficult to conceive an effective conservation movement in the USSR, that is one which could--without governmental support--grow to the point of bringing pressure on the basic institutions of the society.

Within the United States the economic and political pattern by states appears to be sufficiently similar to constitute a control group. North Dakota, with its trace of agrarian socialism, raises a few questions, but the number of units investigated should obviate any serious problem of bias it might introduce.

⁴ See: pp. 86-87 below.

seem to suggest itself as readily as that of "resource control." But since "conservation" carries the connotation of a particular type of resource control I prefer, in general, the broader term. More to the point, the phrase "resource control movement" allows sufficient latitude to circumscribe not only the "lock-up and leave" conservation of many of the early advocates but the "multiple land use," "sustained yield," and "intensive use" policies of the present day.

At this point I will not attempt a further elaboration of the resource control variable since this will emerge in the historical review and the operational definitions or indexes offered below.

As to the "industrial society" variable, I refer to events of the past two hundred years in the West. Specifically to the enormous elaboration and accumulation of complex, specific, and costly machinery as the major technological productive apparatus, and the use of the fossil fuels and water power, and their derivatives, to actuate such machines. But more broadly I include--by addition of the term "society"--the social consequences, highly attested, that have accompanied the industrialization of society. In particular I make reference to the growth in size and concentration of population, the growth in size and concentration of urban

political units, the increase in wealth per capita, and finally, the growth in size and concentration of industrial organizations of production.⁵

Again, at this point, I will attempt no further elaboration of the industrial society variable since this should also emerge in the operational definitions offered below.

It may now be apparent that my subsequent treatment of the resource control movement is going to differ markedly from the usual procedure. First, I am largely going to eschew the case study method for an ecological approach. The case method may be adequate for some purposes, but it will clearly not work for forty-eight units of investigation, at least not in my life time. And while the case study method might be desirable for a national study (and probably more feasible in terms of data), the national level is a subject necessarily beyond the scope of this study. It is true that by collecting data on forty-eight states some information is going to be

⁵ The terminology of my definition of "industrial society" is largely borrowed from Karl Polanyi's, The Great Transformation (Rinehart & Co., Inc., 1944), pp. 39-42. Other authors are in full accord, however, see: R. J. Forbes, Man the Maker (Henry Schuman, 1950) for a detailed treatment of the technology and engineering, esp. pp. 136-266. Also see: S. Lilley, Men, Machines and History (Cobbett Press, 1948), esp. pp. 35-123.

collected for a national analysis. But such a study would be non-comparative unless international, and the international focus requires some understanding of the major variable before it should be undertaken. Second, I am not going to use historical materials as data (a fact which might be deduced from the rejection of the case study technique). Therefore, except for an impressionistic historical survey of the social movement--designed to acquaint the reader with the empirical problem--the biography or life cycle method is rejected.

History and Hypotheses

At this point it seems wise to present a brief survey of the history of the movement followed by a classification and brief examination of the hypotheses advanced to explain its occurrence. This will serve two purposes. First, it will acquaint the reader with the empirical problem, the facts or initial conditions of the case. Second, it will throw into bold relief the nature of my substantive hypothesis and how it differs, is coterminous with, or goes beyond extant substantive theories. Since historical data is going to be presented only as illustrative of the problem, the review will be very general. Finally, I am going to trace the historical events only at the national level even though I am not specifically concerned with a national problem.

This I do because it is as good a summary device as is needed to point up the state by state empirical concern.

The history of the federal resource control movement in the United States has passed through several of the distinct stages often suggested in the "life cycle" descriptions of social movements. Since my concern is not with social movements as such I shall make no attempt to analyze critically or evaluate the various hypotheses and theories that such descriptions entail. Nevertheless, by employing in a descriptive, rather than in an explanatory sense, some of this technical terminology, many of the chief features of the resource movement can be easily appreciated.

First, the movement is a type of "collective behavior." Turner and Killian, for instance, define collective behavior as the "study of the behavior of collectivities." And a "collectivity" is in turn defined as "that kind of group characterized by the spontaneous development of norms and organization which contradict or reinterpret the norms of organized society."⁶ Finally, a "social movement" is a "collectivity acting with some continuity to promote a change or resist a change in the society or groups of which it is a

⁶ Ralph H. Turner and Lewis M. Killian, Collective Behavior (Prentice-Hall, Inc., 1957), p. 4.

part."⁷ Thus social movements are distinguished from: "mass movements," which are essentially individual but with large scale support; "followings," in which the attachment is to leaders rather than to programs; "cults," which demand behavior alterations only of their followers.⁸ Social movements are further distinguished from "political parties" by not being necessarily linked to nation-states and by being integrated around an ideology as opposed to integration around "the struggle for political power"; movements are also distinguished from "pressure groups" by the limitedness of the latter's social goals; and social movements are distinguished from "social tendencies" such as urbanism by the latter's lack of organization or coordination. Social movements are, therefore, groups of a distinct kind--the collective--with distinct constitutive programs or ideologies.⁹

The resource control movement has been pictured in the following terms. It gained its initial, as well as some of its long-term support, from emotional "acting crowds" and

⁷Ibid., p. 308.

⁸Ibid., pp. 308-309.

⁹Discussion of the relation of social movements to political parties, pressure groups, and social tendencies as well as the "constitutive ideas" or ideology are all nicely developed in Rudolf Herberle, Social Movements (Appleton-Century-Crofts, Inc.), pp. 6-19.

and from "interest publics"; it terminated in diffuse institutionalization within administrative structures. Its ideology similarly changed, in the classic picture of the movement, from the initial emotional responses of acting crowds and the debates of interest publics, into formal articulation and competitive development, and ended by entrenchment and partial emasculation in administrative policy of today. Viewed as a whole, many of the schemes for classifying social movements can be used as descriptive generalizations of the resource movement. First, classified according to the values that it advanced it was, of course, aimed at conservation of culturally defined renewable and non-renewable resources. Viewed according to the direction of change that it proposed, it was generally progressive with limited reactionary elements. Viewed in terms of the rate of change that it proposed, it was reformist rather than revolutionary. Viewed in terms of its tactics of action and source of support it was militant and pluralistic. Viewed in terms of Turner and Kallian's "integrated classification" it was "respectable-factional."¹⁰

¹⁰ See: Collective Behavior, op. cit., pp. 320-30. For additional general discussion of collective behavior and social movements see: C. Wendell King, Social Movements in the United States (Random House, Inc., 1956); Rudolf Herberle, Social Movements, op. cit.; Herbert Blumer, "Collective Behavior," Review of Sociology (Joseph B. Gittler ed., John

Such a list of descriptive adjectives characterizes a number of salient features of the movement. First, it was not: mass movement, cult, following, political party, pressure group, or social tendency. Second, it was: a type of group organization with distinct ideology, concerned with resource control, generally progressive with elements of reaction, reformist, militant, pluralist-factional, and respectable-legitimate.

Viewed in this manner we may now turn to the historical picture. The movement passed through a number of sequences in its 100 year history, though, of course, its social basis had been much longer in the making. From the exploration, fur trapping, and mining operations of John Bartram's "new green world" there commenced full scale capitalist or market exploitation; this was followed by gathering protests from at least eight sources.

First there were the nationalists. They sought security through the conservation of militarily important natural resources. While there were few state based protests of this sort, criticism of resource use by security minded

Wiley and Sons, Inc., 1957), pp. 127-58. Also, for an extended treatment by Heberle of some of the issues discussed in Social Movements see "Observations on the Sociology of Social Movements," American Sociological Review, Vol. 14 (June, 1949), pp. 346-57.

groups gave general legitimacy to the movement as a whole. Second, there were religious elements in the cry against market determinants of resource use. These were generally localized and regional. Third, there were the mystic and literary naturalists who acted as ideologues for the movement. They were an eloquent and highly literate group: John Bartram and William Bartram, John Muir, John Burroughs, Henry David Thoreau, Earnest Thompson Seaton, Alexander Wilson, John James Audubon, Walt Whitman, and Mary Austin; and more recently Aldo Leopold, Donald Culross Peattie, Edwin Way Teal, John Kieran, Rutherford Platt, William Beebe, Rachel L. Carson, Joseph Wood Krutch, and Sally Carrighar. By diffusion Anglo-American patterns developed, with the English inventing and passing on to the New World some of the major styles or patterns of nature writing and protest. Men such as Walton, White, Hudson, Wallace, Darwin, Bates, Still, Jefferies, Waterton, and Tomlinson particularly stand out. Fourth, there appeared the "natural balance" or ecological arm of conservation. Malthus and the population theorists were responsible for certain aspects of this protest; more recently Osborn, Vogt, Sears, Marston Bates, and Brown are representative. Most of these men were scientists of one type or another and they wrote from their respective positions. Their chief concern was environmental destruction

and the web of life relations that support man. Fifth, economic interest groups, that saw resources as means to market profits, constituted another source of protest. The problem was one of long term survival of the economic enterprises utilizing such resources as timber, oil, water, fur, fish, metals, pulp, and other renewable and non-renewable resources. Sixth, the recreation protest was an arm of conservation supported by camping, hunting, fishing, travel, and a dozen other special interest recreation groups that saw their survival in terms of the preservation of wild areas. Seventh, political communities found themselves wrestling with water and pollution problems. These communities protested such typical problems as having to dig out from the effects of hydro-mining in the Columbian goldfields in California's high sierra country.

Eight, an important group of applied scientists (Pinchot, Maxwell, McGree, Newwell, Coville, etc.), employed in various agencies and involved with various resources, extended the rationality of their specific competencies into an ethic aimed at the rational allocation of conflicting resource claims, and argued that this should be done by administrative act rather than political dealing. This fact heralds the growth of centralized administration--after

the Civil War--and the truth of Weber's point which posits a shift from political to bureaucratic decision-making. Perhaps as both Schumpeter and Weber argued the rationality of capitalism engenders a generalized rationality that encroaches on larger and larger areas. In any event, the rational disposition of resources was vigorously encouraged by these applied scientists. They constituted a politically involved and highly conscious conservation elite, and they may generally be viewed as the de facto leaders of the movement.

It is worth noting--as will be shown--that much of their polemic was directed toward each other rather than toward the large corporations and trusts generally cited in conservation histories. As in the case of Dinosaur National Monument in our time, the real conservation battle was often between competing conservationists (paleontology versus soil and irrigation) rather than with the "vested interests."

In one way or another the common reaction of these groups has been to the problems of industrialism within a democratic-pluralist system organized around capitalistic markets. The kind of resource use to which they reacted has been often described: Millions of acres of prime forest destroyed by uncontrolled fires; the great, western white

pine stand of Idaho-Montana which was literally blown to extinction in 1910; the decimation of an estimated 60,000,000 buffalo; the extinction of the billions of passenger pigeons Alexander Wilson saw blacken the Kentucky skys; the vanished, or nearly vanished, herds of pronghorns and mountain goats; the near destruction of California's Central Valley waterfowl; the Kaibab deer; the depletion of the Lake Superior metal ranges; the fear for the oil reserves; the silting of streams and lakes and the pollution of Eastern rivers with wastes; the destruction of prime recreation areas and the depletion of upland game and trout fishing; the concern over trace and major non-metallic minerals; and the loss or near extinction of the Carolina parakeet, the whooping crane, the trumpeter swan, the condor, the flamingo, the ivory bill, the wild turkey, the spoonbill, the grizzly, the mountain lion, the fisher, the wolverine, the prairie dog, the wolf, the grayling, the lake trout, the white fish, the pasque flower, the American chestnut, the Sierra redwood, and the sea otter.

The first nationally organized attempt to develop rational resource control was the Governors' Conference called by Theodore Roosevelt in 1908. Perhaps more than any other group the applied scientists (mentioned above)

brought their knowledge and personalities to bear on Roosevelt. The President had a basic faith in applied science and he listened intently to these leaders in his own administration. With the usual enthusiasm of those that want to get things done, Roosevelt opted for the rational decision makers, sometimes at the expense of politics.

But locally there were actions afoot that were already registering the impact of the movement. Michigan got its first deer limitation in 1857 (five per capita). Early national parks were set aside in response to state as well as federal demands: Hot Springs in 1832, Yellowstone in 1872, and General Grant and Sequoia in 1890. In 1858 the land grant colleges were established and were destined to have fundamental state and national impact upon conservation and resource control. New York designated the famous "forever wild" areas upstate by constitutional amendment in 1894. The wilderness idea was born shortly after World War I, and Leopold's Gila Wilderness was only the first of a large number of primitive regions set aside "forever." The Withdrawal Act of 1910 had already given the President of the United States control of minerals, water, power, and irrigation, indicating that the Governors' Conference had indeed crystalized a movement of national

proportions. In 1905 Gifford Pinchot, soon to become a national conservation leader, headed the Forest Service. Even at this time he was being encouraged and encouraging policies verging on multiple land use. The National Park Service had originated in 1916 and was to develop rapidly. A dozen bills around the turn of the century, and especially under the leadership of the early Roosevelt's nationalistic aspirations, legitimized the movement at the federal level.

Conservation or resource control did not get another national leader until Franklin D. Roosevelt. But with FDR came not only TVA but the basis for widespread application of a tri-partite ideology which has come to dominate the movement of today: multiple land use, sustained yield, and intensive use. The Wildlife Refuges Act of 1937, the Migratory Bird Treaties of the same period, Flood Control Act of 1936, the CCC, the Taylor Grazing Act, with its land classification program which was to become the basis for the use orthodoxy of today. The Norris-Doxy Act passed in 1937. It extended technical aid to private lumber interests and advanced ideas initiated in the Clarke-McNary and McNary-McSweeney Acts which had passed in 1928. This particular legislation established reforestation on a huge scale, enlarged national forests (especially

the critical watershed areas) and established the basis for the long awaited cooperation of federal, state, and private interests in forest fire fighting. It also gave the statutory basis for the rational application of science to forestry research.

Since World War II there has been Mission 66, National Security Resources Board, Multiple Mineral Development Act, the enormous proliferation of the recreation arm of private and governmental interests. At the state level nowhere is the entrenchment of conservation more clearly seen than in the 1957 dispute over the Michigan Porcupine Mountains State Park and today's Sleeping Bear controversy. Resource control organizations as far off as California's Sierra Club came to Michigan to testify. And the continuing research by the states bordering the Great Lakes, by Ontario, and the Canadian and United States federal governments on lamprey control, with Michigan's State Department of Conservation assuming the basic load--all of these bills and actions suggest the impact of the conservation and resource control movement on the national and state scene.¹¹

¹¹The following sources are of greatest value in conservation history. Most of the works cited contain the Progressive Era bias which views conservation in the context of public versus corporate claims. Nonetheless the sources do contain the relevant information on the movement as a whole and for selected aspects:

There are few truly general histories of conservation. Perhaps the developments were too diffuse. Most histories are

written from the point of view of some special aspect (forests, water, range, rivers). For general works see: Samuel P. Hays, Conservation and the Gospel of Efficiency (Harvard University Press, 1959). This is an especially useful work for its development of the anti-reform, anti-populist view of conservation history. In particular it concentrates on the applied science conservation leaders in areas such as forests, range, water, minerals, etc. But this concentration is intended to reverse the "age of reform," muckracker, view of the meaning of conservation. As we shall see below it parallels Richard Hofstadter's implications in the The Age of Reform (Vintage Books, 1955), i.e., that the populist and progressive movements reflect "status politics"; that historians sympathetic to both have accepted the rhetoric in constructing their histories; and that this rhetoric, as is well known, is anti-big business, anti-urban, and anti-monopoly. It is, of course, in one to one correspondence with the major empirical hypothesis of this dissertation. See for general background: H. H. Bennett, Our American Land, the Story of Its Abuse and Its Conservation, United States Department of Agriculture, Misc. Pub. 596, 1950, for a short coverage; Richard M. Highsmith Jr., J. Granville Jensen, and Robert D. Rudd, Conservation in the United States (Rand McNally & Co., 1962), esp. the introductory historical review; Clair Wilcox, Public Policies Toward Business (Richard D. Irwin, Inc., 1955), pp. 339-70; Henry Jarrett (ed.), Perspectives on Conservation (The John Hopkins Press, 1958), esp. pp. 3-45 for historical review and comments by several authors; Roy Robbins, Our Landed Heritage (Princeton University Press, 1942), the most complete single work; for treatment of the early period in terms of Progressive Era orthodoxy see: J. Leonard Bates, "Fulfilling American Democracy: The Conservation Movement, 1907 to 1921," Mississippi Valley Historical Review, Vol. 44 (June, 1957), pp. 29-57; specific works of considerable detail include, for range: H. Louise Peffer, The Closing of the Public Domain (Stanford University Press, 1951); for wildlife and preservation: Robert Shankland, Steve Mather of the National Parks (Alfred A. Knopf, Inc., 1950); A. F. Gustafson and Associates, Conservation in the United States (Comstock Publishing Associates, Inc., 1949); Aldo Leopold, "The American Game Policy," Transactions Seventeenth American Game Conference, (Wildlife Management Institute, 1930); Edward H. Graham, The Land and Wildlife (Oxford University Press, 1947); for atmosphere and water resources: Barrow

This brief survey of the history of a social movement has been concerned primarily with results, in the form of statutes, as a necessary method of presentation. In summary we may say that the resource control movement began as a response to capitalist disposition of resources; during this period protests became more frequent, and articulate spokesmen and ideologists (especially scientists and literati) emerged; they had some local and state effect by the middle of the nineteenth century; formalized state and national structures did not emerge in significance until after the 1908 Governors' Conference, when nearly all states set up conservation commissions of some sort; at this time organized administrative agencies began to play a significant role in resource control; this was the era of "lock it up" conservation; private resource control organizations began to proliferate shortly after the turn of the century and they have flourished ever since; by the twenties state and national government had their hands firmly entrenched

Lyons, Tomorrow's Birthright (Funk & Wagnalls, Co., 1955); for forests see: Samuel Trask Dana, Forest and Range Policy: Its Development in the United States (McGraw-Hill Book Co., Inc., 1956); Luther H. Gulick, American Forest Policy (Duell, Sloan, & Pearce, 1951); Ovid M. Butler, American Conservation in Picture and Story (American Forestry Association, 1935); for a fascinating autobiography of an early forestry chief and conservation leader: Gifford Pinchot, Breaking New Ground (Harcourt, Brace & Co., Inc., 1947); for minerals see: R. T. Ely, et. al., Foundations of National Prosperity (The Macmillan Co., 1923).

in resource dispositions; with FDR the heavily preservationist conservation of the early movement faded; land classification began with the intention of implementing multiple use and sustained yield ideologies; the national planning and security issue became much more important; and finally, with the entrenchment in private and public structures of extensive multiple use commitments, organizational policy focused on the ultimate security of national sovereignty and use which dominates resource control today.

As in the case of so many social movements, the change that was sought was partly achieved and partly diverted.¹² Today it is fragmented in more than half a dozen organizations of national government, and the controls it envisioned have been developed, even while the ends have shifted. Resource designation exists today by virtue of its inclusion in the policies of the Department of the Interior, the Department of Agriculture, and the Engineer Corps, and exists by control

¹²It is interesting to note that conservation in the United States, indeed in the world, has been an ideological movement (i.e., half-science, half-value, all-action) and that the attenuation and diversion of its doctrine or, to use Barrington Moore's phrase, its "charter myth," parallels quite closely the attenuation and diversion, even the reversal, that another movement's (partly a conservation movement) ideology underwent. See Philip Selznick, TVA and the Grass Roots (University of California Press, 1953), esp. pp. 47-74 and 181-205.

or interaction with the Interior and Insular Affairs Committee, the Agriculture Committee, and the Committee on Public Works in Congress, and all are indirectly under the control of the Bureau of the Budget and administrative fiscal policy.¹³

Professor Hart points out this absorption in his 1958 address to a Resources for the Future group:

. . . conservation no longer expresses a self-contained and self-justifying purpose; resources have become means to ends as diverse as growing proteins, living urbanely around cities, and winning international security. Theodore Roosevelt's conservation crusade stood concerted and largely independent. Franklin Roosevelt's conservation programs were means to recovery and victory, as well as to restoring a natural harmony. From this point of view it may not have been a backward step that when the National Resources Planning Board had been liquidated, its vestigial functions reappeared in two separate contexts, that of the Council of Economic Advisers, and that of National Security Resources Board and its successor, the Office of Defense Mobilization. More and more we have been conserving for something that seems more nearly ultimate.

It is fitting and proper, then that we do not find ourselves, after fifty years, gathered in a crusade. We are researchers and teachers of not one but dozens of new sciences and engineering fields illuminating and serving various aspects of useful nature: soil science, hydrology, ecology, economic geography, waste control, water and air sanitation. We are policy makers in separate but related areas. . . . Conservation crusaders can expect no Armageddon now, but a lot of bushfire wars on pollution, power, flood control, wilderness areas, military versus economic uses of the atomic nucleus.¹⁴

¹³Ernest S. Griffith, "Main Lines of Thought and Action," in Henry Jarrett (ed.), Perspectives on Conservation, op. cit., pp. 11-12.

¹⁴Henry C. Hart, "The Changing Context of the Problem," Ibid., pp. 34-39.

In short, resource control today has the sound of a successful movement. And as one examines the literature on social movements it seems evident that conservation, as a movement, has reached the stage of senescence, the end of its life cycle. It is part of our world, everyone is for it, and it is built into the structure of our national government though fragmented and disguised. Thus at the federal level the movement has nearly run its course. But what may be true of the national movement is not the case with the states. They show enormous disproportions in respect to resource control. At the states' level the degree to which rational resource measures have been institutionalized varies tremendously. This is our problem.

How then to explain the phenomena of differentials in resource control by states? Before turning to my empirical research design it is worthwhile advancing the variety of hypotheses or theories that have at one time or another been used as an explanation of the movement. All but one of these theories are of a folk nature, casually tossed off without much thought being given to their confirmation. Some of them are clearly designed to explain only the interests of limited groups, while others seem to hint at movement-wide characteristics. Some of these we have already briefly

examined in the historical survey. In this review I will present my own explanation or hypothesis. Furthermore, I will place this explanation in the framework of a still wider explanation of the nature of industrial social structure.

It may be worth noting that many of the hypotheses I am about to review are apparently correct for their limited specifications. Many individuals and special groups did participate in conservation for the reasons indicated. However, most of these explanations lack confirmation and are seldom spelled out in detail.

The first explanation is famous, in its own right, as a historical hypothesis, almost as a received truth. It is perhaps the most frequent explanation of the movement found in the literature of conservation. Put simply it is the populist-progressive, age of reform, argument that the "little man" (meaning, the small farmer, small businessman, small merchant, small industrialist, small town dweller) rose out of the south and west to join battle with the "trusts" (meaning, big business, big industry, big urban areas, and therefore the big monopolies and vested interests)--that the "little man" rose up and smote the wretched oligarchs. It constitutes the central thesis and the general prevailing outlook in American historiography (until recently) regarding

the meaning of the "age of reform" (mainly 1890-1917). With the exception of Hays, Hofstadter and a scatter of economists and critics (Schumpeter, Galbraith, De Voto) it continues the tradition of the muckrackers and the American romance with the small free-holder and the independent family capitalist enterprise.

Otherwise, populism and progressive politics are seen as the triumph of the rurals over the urbans, the old-line Protestants over the immigrant Catholics, the free entrepreneur over the business bureaucrat, in short, the triumph of Henry Nash Smith's "theme of the garden of the world"¹⁵ over Durkheim's "organic solidarity" and the "division of labor." However one pictures the age of reform, the classic image must invariably include the righteous indignation of the "small man" against the rape of the resources, the political corruption, and the illegal possession of the land on the part of eastern trusts. The conservation movement is one aspect of this general response, and the common explanation for the uprising traces its sources to the desire to replace corruption with fair play, politics with rationality, opportunism with idealism--it is in short essentially a value interpretation of the course of events,

¹⁵Virgin Land (Vintage Books, 1957), pp. 138-200.

one in which morals move history. Later historians, generally sympathetic to the aims of conservation and generally inclined toward similar values, have maintained the hypothesis.¹⁶

The next group of theories may be called the mechanistic explanations. The simplest one is the "nature instinct" hypothesis. Supposedly man needs the wilds to maintain psychic or aesthetic balance. Without wild areas men lose a sense of proportion. Many of the evils of modern culture are said to be the result of cutting man off from his primordial roots. Therefore, men mobilize to preserve nature as a response to potential or actual instinctual frustration.

Whether any "instinct conservationist" would explicitly want to go this far is an open question. Spelled out so baldly (i.e., there is a gene on the tenth chromosome for "needing nature") it appears grotesque. But by not spelling out the proposition quite so explicitly many authors have in fact supported such contentions. In literature Knut Hamsun represents an extreme case; in natural history Joseph Wood Krutch is typical; among conservationists Justin W. Leonard is a good example.¹⁷

¹⁶See relevant works as indicated in footnote 11.

¹⁷Knut Hamsun, Growth of the Soil (Random House, Inc., 1921); also by Hamsun, Pan (Noonday Press, Inc., 1956); Joseph Wood Krutch, The Great Chain of Life (Houghton Mifflin Co., 1956); Justin W. Leonard, People and Land, Information Leaflet (New York State Conservation Department, 1961).

The criticism is simple. First, social science has shown no evidence of instincts (i.e., complex and specific genetic based reactions to complex and specific stimuli) in the human animal. Also it is clear that many men spend all their lives in cities without apparent ill effects. Europe has been urban for a great period and New York, Calcutta, Damascus, and Tokyo also have their urban types. If instinctivists argue that this is precisely our trouble, i.e., the cause of our wars, addiction, mental illness, well and good. But let them then specify under what conditions their theory might be proven false. For clearly a theory without a potential area of invalidation is superempirical.

The second mechanistic hypothesis is divided into two types, both of which may be dealt with here. The first is the mechanistic theory proper, the second is essentially social. "Religious callings" have been suggested as an explanation of conservation activities. If religious action is looked upon as a supernatural instruction, then it is mechanistic. But if conservation action is viewed as merely deriving from religious values, then it is social.

Romain Gary has given an impassioned description of the individual called by acts of preservation by God. In the novel, Roots of Heaven Gary portrays a Danish naturalist

who argues that all the plants and animals, all the species, are the literal roots of heaven; kill the roots of heaven and you kill heaven itself. Destroy the profane order and you destroy the sacred order as well. While Gary himself is innocent of this belief it is clear that others have taken it literally.¹⁸

The argument need not detain us. Religion, as a cognitive system of truth, is super-empirical. Super-empirical matters are cognitively meaning-less. Therefore, the religious argument is cognitively meaning-less.

However, as a belief (a social belief in a calling) I have no doubt that many converts to conservation have come through the religious door. And while the history of conservation lends little support to the contention that this was the sole, or even a significant cause of the resource movement, it clearly did play a small part in particular motivations. Nonetheless, the organized and continuous behavior of religious groups shows no evidence of its widespread impact upon conservation.

Turning to social explanations, in the strict sense, we may review several. There is first the "national interest" or "security" argument. The idea seems to be that men perceiving

¹⁸ Romain Gary, The Roots of Heaven (Pocket Books, Inc., 1958).

our nationalistic needs rallied to support conservation issues. At the national level, I am sure this is a partial explanation of many significant developments, especially those of direct governmental action. But the states have no armies to equip, no conquests to mount, and no international treaties--with few exceptions--to conclude. What may hold for a national movement is clearly inadequate to explain the differential development of the movement at the states' level.¹⁹

There is next the diversity or "variety hypothesis." The argument is again simple. Men engage in conservation because of the desire to prevent the extinction of multiplicity and diversity. Every species that perishes is that much lost variety. Here, recreation groups as well as ideologues are commonly at work. It is safe to say that the vast majority of naturalists held or hold a set of values similar to this. Recreationists have had perhaps identical interests

¹⁹ While the military get their due (along with the nationalists) in all general histories of conservation the following are of particular interest: H. J. Barnett, "The Changing Relations of National Resources to National Security," Economic Geography, Vol. 34, No. 3 (July, 1958); also see Samuel P. Hays, Conservation and the Gospel of Efficiency (Harvard University Press, 1959); Resources for Freedom (United States Government Printing Office, 1952); Roy Robbins, Our Landed Heritage (Princeton University Press, 1942).

but for reasons of sport.²⁰

There can again be no doubt that some hypothesis such as this is a sound explanation of individual and group actions. It holds, however, for only a limited few, the professional appreciators, though the value of diversity is also a strong feature of western culture generally. But is it enough to account for the social movement? Clearly not by itself. Expositors of diversity have been the most articulate group to fight for conservation of resources. But they are only a fragment of the mass support.

Another form of the diversity argument, and another source of support for conservation, derived from the ecological thinkers. In the writings of this group the exhaustion of resources is seen as a threat to the "balance of nature," with the implication that once out of balance

²⁰ Preservationists, recreationists, and mystic-literary naturalists are all included in this category. For the literary and the mystical appreciators see the sampler: Edwin Way Teale, Green Treasury (Dodd, Mead, & Co., 1956)--also note the bibliography of nature writing inside the title page. For a popular survey of a few of the great naturalists see Donald Culross Peattie, Green Laurels (Doubleday and Co., Inc., 1936). Not surprisingly several naturalists have come from literature itself: Thoreau, Whitman, Krutch, et al. For a descriptive and able statistical and historical review of the recreation arm see: Marion Clawson, R. B. Thell Held, Charles H. Stoddard, Land for the Future (The Johns Hopkins Press, 1960), esp. pp. 124-93 (also contains excellent bibliography on recreation-preservation uses).

the whole show goes under.²¹

Viewing these expositors of balance as a social source of conservation has only limited justification. Most of them appear late in the history of the movement, and most took intellectual positions that failed to win mass support, though no doubt their writing was influential among leaders.

This leads me to a consideration of what is probably the most frequent lay reply to the question "why a conservation or resource control movement?" Advanced at the states level the most immediate reaction is to point out that some states need conservation control and others do not. Of course this "needing" of conservation is precisely the question! Why do some states perceive this need and others not, as for instance the Deep South? Apparently "need" is perceived differently by differently situated social groups. And such differential perceptions are what must be explained.

The next most common responses, to the question of the movement's development, attributes it to an American nostalgia for "rusticity," "ruralness," or the "lost agrarian

²¹For a sample of this school try: Henry Fairfield Osborn, Our Plundered Planet (Little, Brown & Co., 1948); William Vogt, Road to Survival (William Sloane Associates, 1948); Harrison Brown, The Challenge of Man's Future (The Viking Press, 1954); Paul B. Sears, Deserts on the March (University of Oklahoma Press, 1935).

past." A similar explanation is generally given for suburbanization, cabins on lakes, and selection of retirement and burial sites. This explanation specifies no groups, no specific interests, no sociological mechanisms. It appeals only to the continuance of a set of values. These values float insubstantially above the subjected population and somehow influence social action. It reminds one strongly of "national character" studies current in certain quarters; studies which generally fail to specify the social formations, groups, and the interests of such groups which support the values in question.²²

Values are not self-supporting. Nor are needs self-explanatory. If there is one truth confirmed by social science, this is it! They are the result of perspectives and interests derived from social formations. The important question is to specify these formations. Merely to point to values or the needs of peoples is to call attention again to what we wish explained: why do the values persist, why

²² Both the notions of "need" and "value" have been offered as explanations even from trained and involved conservation leaders. In discussion I have had each of these ideas put forward as supposedly adequate explanations from otherwise competent people. The general tendency to name, without specifying, the sociological formations that support needs and values is apparently endemic, even in social scientists. The work of Gorer, Mead, Powdermaker, Brogan and others often lapses into similar tautologies--tautologies in need of explanation.

does one group see needs where another group does not? And this is true not only of the pure value or need explanation, but of all other explanations that suggest grounds for action without specifying the social organization integrating that action.

In turning to my own hypothesis we will be examining a view deliberately designed for generality and inclusiveness. While admitting the worth of some of the foregoing ideas on conservation, my aim will be to select an explanation that will encompass all such limited groups with their limited interests, as well as challenge the liberal historical hypothesis. My hypothesis has the advantage of generality plus the not insignificant fact of subsequent empirical examination.

The hypothesis with which I am concerned may be stated in the following manner: as industrialization increases, not only in the productive apparatus but also in terms of its wider societal implications, the institutionalization of rational resource control in the several states varies directly.

This formulation of my hypothesis contains implications that may not be altogether apparent. Clearly, it is a law-like statement describing the relation between two sets of

events in the contemporary world. To this extent, as we shall see below in the discussion of the explanation of this regularity, it attempts to explore, with present day materials, an invariant relation. If confirmed, this relation will constitute an explanation of these substantive events. In terms of one aspect of this regularity I posit a rather general theory: that the larger the organization, the more centralized the decision making; the more centralized the decision making the more obvious the implications of the scattered needs of the organization; the more obvious the needs, the more likely are decision-makers to perceive the natural resource base upon which their organization rests--whether the organization be an urban political unit or a large scale industrial enterprise. This kind of explanation is clearly drawn from organizational theory and appears generally reasonable. But are there any other implications of the hypothesis, implications that open up wider considerations beyond contemporary events? I believe there are.

The history of conservation is a phenomena quite distinct from contemporary investigations into its social base. Yet it requires only a moment's reflection to realize that if the contemporary materials are of the proper sort, they may also shed light on the nature of the historical

situation--even if they cannot conclusively prove or disprove a strictly historical hypothesis. I am reminded of Weber's use of data on the relation between economic position (as measured by social class) and religious affiliation in the early chapters of the Protestant Ethic. As Weber noted: in itself such data cannot prove or disprove the larger regularity, but certainly it casts light on the situation and certainly it must be taken into account.

The historical hypothesis with which this dissertation crosses swords is, of course, that offered by the populist-progressive historians (our first hypothesis in the present review)--the little man versus the trusts. Recently this conception has come under attack from a Harvard historian, Samuel P. Hays. It is this attack by a historian, coupled with my contemporary data, plus the implications of a group of economists and critics, that will constitute the historical side of my hypothesis. The issues are fairly involved and require a rather lengthy review.

Conservation, as Samuel P. Hays in Conservation and The Gospel of Efficiency* points out, has generally been viewed (in the context of Progressive Era politics) as a battle between the "evil vested interests" (mainly, the corporations and

* Harvard University Press, 1959, pp. 1-4, 261-76.

communities) and the "good un-vested public." In fact, it is so much of the liberal heritage to view the problem in this manner that virtually no one thinks to question the obvious. Hays points out that the few general histories as well as the more numerous specific studies of conservation invariably review the battle of the "interests versus the public." Now it may be good liberalism to do so, but, Hays argues, it just was not the case.

Shifting through a mountain of evidence on the national scene Hays came to the same conclusion that I arrived at by deduction from general principles (especially those of economics and organizational theory) at the states' level. Mainly, that large scale organizations of no matter what kind (whether business or industrial structures or urban administrative units) imply planning and a large over-view, and therefore the greater probability of recognizing their resource base (to be discussed below). Perception, in other words, is a function of size.

Now what Hays has done at the national level and for the movement's leaders I am in effect testing at the state level. The notion that large scale industrial corporations and large urban units should support and encourage conservation measures is Progressive History heresy. If

it is supported at the states' level then there will be at least two students of the movement that are in sharp dissent with the overwhelming opinion. Hays sums up his argument thus:

Such examples, however, do not support the general view that corporations by their very nature promoted resource waste, and the larger the corporation and the greater its self-interest, the more destruction it caused. On the contrary, when the conservation movement arose in the early twentieth century, it became clear that larger corporations could more readily afford to undertake conservation practices, that they alone could provide the efficiency, stability of operations, and long-range planning inherent in the conservation idea. Larger owners could best afford to undertake sustained-yield forest and range management, and understood more clearly than did small farmers the requirements for large-scale irrigation and water power development. [Italics mine] (Ibid., p. 263.)

Also in an article in Perspectives on Conservation, Henry Jarrett (ed.),* entitled "The Mythology of Conservation" Hays argues a similar point.

Whether or not the present notion implies a conservative political outlook is not so important as what was in fact the case. The historians, few though there are, are so loaded in the direction of anti-monopoly and anti-trust "rape of the resources" that little distinction was made between the ownership of resources and the use of resources. They were not necessarily connected either in the past or now, and the misuse of one did not necessarily imply the

* Op. cit.

misues of the other. As Hays argues, more often it was the small owner that fought conservation and misused the land. And while true that the Great Lakes Forest were raped and the Teapot Dome indeed scandalized, it does not follow that this was the general picture. Hays argues contrary on the basis of a massive sifting of the evidence at the national level. I am going to argue on sociological grounds that even today it is not the case by states. The political implications may fall where they will. I am privately as suspicious as the next of corporate interests, but it is worth examining the evidence to see.

Finally, Hays argues that conservation as a movement was the result of a small group of government scientists, technologists, and engineers that wanted to see a maximum utilization of resources along lines dictated by science. He argues that it was these men that influenced the first Roosevelt in his conservation programs: (p. 276)

Social and economic problems, Roosevelt believed, should be solved, not through power politics, but by experts who would undertake scientific investigations and devise workable solutions. He had an almost unlimited faith in applied science. During his Presidency, he repeatedly sought advice of expert Commissions, especially in the field of resource Policy, and he looked upon the conservation movement as an attempt to apply this knowledge.²³

²³For further support of these same ideas see: Marion Clawson, R. Burnell Held, Charles H. Stoddard, Land for the Future (The John Hopkins Press, 1960), pp. 275-360,

But it should not be thought that Hays' work is the only act of protest against the dominant persuasion of populist-progressive history, nor that organizational theory alone and unaided is the only source I can cite to support my general argument and the implied historical implications regarding the conservation movement. Quite the contrary, while Hays codifies the major issues and is excellent at pinning down the evidence on the national scene and among leaders, there are other historians, economists, and critics that have developed aspects of the same contention.

Richard Hofstadter's The Age of Reform,²⁴ is, to be sure, not about conservation, but it is about populism and progressive politics. Hofstadter sees the movement as merely one aspect of a general shift of axis in the structure of American society. In the period 1890-1917 industrial society made its greatest inroads on the agrarian organization of the United States. Until this period the rurals could still convince themselves that history making was in their hands. But by 1890 the evidence had begun to

440-80; Erich W. Zimmermann, World Resources and Industries (Harper & Brothers, 1951); William L. Thomas Jr., Man's Role in Changing the Face of the Earth, ed. (University of Chicago 1956), esp. pp. 367-81, 851-92, 987-1134.

²⁴ Richard Hofstadter, The Age of Reform (Vintage Books, 1955), pp. 131-73.

pile up against them and doubt of their continued status ascendancy had become widespread. Hofstadter argues that in response to this "status revolution," in fact in the only response possible, the agrarians staged a revolt. That revolt was populism.²⁵

Basically it was a moral and ethical protest, for the simple and sufficient condition that they had no other means of protest at their disposal. The large industries, the great trusts, the financial empires, the bankers, and the great cities overwhelmed and diminished them. But by the conservatism of history the rurals still had some control over the representational vote, even if they lacked the economic, industrial, and national power. They had only one course to take and they took it--a moral revolution against the corruption, trusts, vested interests, monopolies, Catholic laxity, and the big cities. Honor had slipped from the rurals to the urbans, much as honor today continues

²⁵ John D. Hicks, The Populist Revolt (University of Minnesota Press, 1955), should be considered the classic statement on populism. However, Hofstadter gives a rather different interpretation to the events, and I have followed him in general. Basically Hicks' iterates the liberal position, and argues that the rurals had good reason for outrage against the East. He neglects, however, the question Hofstadter sees as central, i.e., why the movement took the form it did and its meaning in terms of power shifts.

to slip or fails to be conferred--as witnessed in the "status politics" of the radical right.²⁶ Economic issues may be important, especially in depressions, but status may be more so. Besides, as few would dispute, in the long run status follows class.

The relationship between this conception of the age of reform and that of Hays' should be obvious. Put in terms of the sociology of knowledge, it means that historians, in championing the populist and progressive reformer, have in fact been sold the populist conception of history.²⁷ They have simply repeated the charges against the urban east that the rural south and west formulated.

Now one ought not to prejudge an issue. Were the industrial trusts and the vested interests really poor conservationists? Did they, as one aspect of the general triumph of the industrial sectors, rape the resources, dispoil the landscape, plunder the oil fields, destroy the forests? In some specific instances clearly they did. But relative

²⁶ Daniel Bell, The End of Ideology, (Collier Books, 1961), pp. 103-23; and The New American Right, Daniel Bell, ed., (Criterion Books, 1955).

²⁷ Hofstadter, op. cit., pp. 13-14: "The tradition of Progressive reform . . . is, indeed, the tradition of most intellectuals in America. Perhaps because in its politics the United States has been so reliably conservative a country during the greater part of its history, its main intellectual traditions have been, as a reaction, 'liberal,' as we say--that is popular, democratic, progressive."

to small businesses, was this a general phenomena? Or have, in fact, the liberal historians simply looked for the supporting evidence for their case? Is, as Hays rightly asks, ownership of the land--which no one can deny resided with the trusts--the same thing as mis-use of the land? Did they, as trusts, relatively violate conservation rationality in the utilization of resources? These questions are considerably more open to controversy than might be expected.

Remember, history for the populist was a conspiracy, a fraud, a vast plot against the small landowner and businessman. Yet, to reverse the question, what about their own history, the history of the small holders? Were they the backbone of the conservation movement? Was it the small holder that practiced the patient, long range, rational planning inherent in the conservation ideology? Did their land use follow the dictates of scientific disposition? The evidence may not yet be conclusive on either side, but we may note a few additional points.

In Bernard De Voto's fascinating history of the Rocky Mountain fur trade we find the following comment:

As regards Astor's American Fur Company (a classic trust even then), "The monopoly's policy was to conserve beaver and trap it scientifically with an eye to the future--

but Oregon was jointly occupied and they might loose it."²⁸

The implication is that conservation would be practiced just so long as there was no competition, for with competition if your own outfit did not strip the beaver country someone else's would.

Again with reference to that other great monopoly in fur, to the north:

The Hudson's Bay Company had the wisest of all systems--or what would have been the wisest if history had cooperated. It farmed the fur country practicing conservation, taking only a calculated percentage from a given field and then letting it lie fallow till the animal population had been restored. . . . That is, in places where the Company was a monopoly. It conserved the fur crop in its private fields but exhausted it as rapidly as anyone where there was competition.²⁹

Now, without pushing too hard, does not this discussion about monopolies and long range planning, trusts and conservation have a familiar ring? Granted that the perception of resource needs are everywhere related to the concentration and centralization. Granted that perception of resource

²⁸ Bernard De Voto, Across the Wide Missouri (Houghton Mifflin Co., 1947), p. 87.

²⁹ Ibid., p. 213. Considering that these events reached their peak in the 1830's in the Rockies and the Oregon Territory it is instructive to see the uniformity of principles operating in the economy, principles such as we are just now "discovering."

needs is a reasonable postulate (beyond a certain size organization) of organizational theory. Do we not also find, in comments such as De Voto's, a supporting economic theorem for my hypothesis: that where there is monopoly there is security, where there is security there are profits, and where there are profits an organization can afford to look ahead, plan rationally, employ science in the construction of the future?

Clearly, in our time two eminent economists are connected with this view: Schumpeter, who argued that monopoly and concentration of capital--induced by depressions--were the central features of the system's incentives as well as its ability to rationally calculate. The ridding of economic marginals through the "cold douche" of the economic crisis promoted growth in scale of economic organizations and conferred a breadth of scope and perception impossible in smaller concerns. At the same time it conferred a security of market and stability of price necessary to rational planning.³⁰

And Galbraith, who has argued that monopolistic oligarchy is the stable form of capitalism. For with market

³⁰ Joseph A. Schumpeter, Capitalism, Socialism, and Democracy (3rd ed.; Harper & Brothers, 1950), pp. 87-106.

security, with monopoly and centralized control, industries for the first time can afford to be efficient in the long run as well as the short. Whereas in the case of the small holders, businessmen, and merchants the long view is economically (not to say intellectually) impossible. Thus in Professor Galbraith's concise formulation:

The showpieces are with rare exceptions the industries which are dominated by a handful of large firms. The foreign visitor, brought to the United States, . . . visits the same firms as do the attorneys of the Department of Justice in their search for monopoly.³¹

To sum up: my hypothesis concerning the empirical investigation of this dissertation has two aspects. First, there is the issue of the social basis of present day conservation and resource control. This argues its point by means of a correlation between industrial society and resource control. The second aspect concerns a historical question. It uses the same findings as those in the first correlation but it does so with regard to their implications for the way history has been written. Thus as regards the first part, size and concentration of organization are related to perception and action. As regards the second

³¹Quotation from Robert L. Heilbroner, The Worldly Philosophers (Simon & Schuster, 1961), p. 270. For extended treatment any of Galbraith's recent works will do, but the most elaborate statement is found in John K. Galbraith, American Capitalism, The Concept of Countervailing Power (Houghton Mifflin Co., 1952).

part, monopoly and security are related to rationality and planning (both today and in the past), and in general both findings cast doubt on one aspect of American social thought.

Finally, there is contained in this discussion an interesting and perplexing question. The implication of these arguments--quite aside from the question of conservative-liberal politics--is that conservation movements represent the response of a pluralistic political and economic system to the necessities of planning. The resource control movement may, in other words, represent an opposite tendency of action from that of open markets and decentralized power.

Political sociology has made much of the differing social bases of totalitarian and democratic systems. The most common feature cited is the monistic and monocratic versus the multi-group pluralism found in the social formations of the two opposing political-economic systems. From the point of view of the resource movement it is difficult to say which tendency it represents. Viewed as the work of a number of applied scientists and strong political leaders the planning appears to work outside the legitimate institutions of democratic society. Viewed as a multiplicity of organizations and protest publics at the states levels it appears to be commensurate with democratic politics. Political sociologists and mass society theorists might

contemplate this dilemma, for both perspectives seem correct. My own initial hunch is that the analysis Hays has given fits well with the (monistic) totalitarian model. But viewing the same phenomena at the states level we have an apparent decentralized reversal. It would seem that again in the United States we have a Tocquevillean pattern.

Whether TVA, national parks, wilderness areas, national forests, and other federal lands represent a destruction of this pluralism is an open question. Federal control has grown, even to imposing its will on the non-industrialized states, i.e., Tennessee. Perhaps the democratic dilemmas of conservation are only an aspect of the dilemmas of national political-economic organization.³² It would seem that the new macro-pluralism of industrial society strains liberal thought to the breaking point, and in conservation it verges on the schizophrenic. Yet even where states receive massive federal aid their independence remains real (as we shall see). How this will appear a few decades hence is open to speculation.

³² See: William Kornhauser, The Politics of Mass Society (The Free Press, 1959), esp. pp. 21-118, 227-38; S. M. Lipset, Political Man, op. cit., esp. pp. 357-96; also Lipset, "Political Sociology," Sociology Today (R. K. Merton, ed.; Basic Books, Inc., 1959), esp. pp. 81-91; and his Union Democracy (The Free Press, 1956), esp. pp. 3-16, 394-418 for more of the same; Philip Selznick, "Institutional Vulnerability in Mass Society," American Journal of Sociology, Vol. LVI (January, 1951), pp. 320-31; and Clark Kerr and Abraham Siegle, "The Inter-industry Propensity to Strike," op. cit., esp. p. 205 for related discussion; finally see Hays himself, in recognition of the same problem, pp. 275-76.

This industrialization hypothesis, taken by states in the United States, might be called a "shotgun correlation" (as distinguished from "shotgun empiricism"). The nearest approach to such a generalized and exploratory correlation is to be found in Professor Lipset's "Economic Development and Democracy."³³ By shotgun correlation I refer to the fact that I shall not present a micro-analysis (i.e., a specific causal explanation) of the correlation at the state levels (such as: analysis of legislation, pressure groups, or similar causal devices) of the actual impact of societal groups on resource designation. The micro-analysis I shall present will be purely verbal; but the reasonableness of this purely verbal connection between the two sets of events will rest upon the initial plausibility of the industrial

³³ Seymour Martin Lipset, Political Man (Doubleday & Co., Inc., 1959), pp. 45-76; also see: Clark Kerr and Abraham Siegel, "The Inter-industry Propensity to Strike--An International Comparison," in Arthur Kornhauser, Industrial Conflict (McGraw-Hill Book Co., Inc., 1954). The Kerr-Siegel article is actually not a correlation at all, since only one systematic variation is recorded (propensity to strike) but in the discussion that follows the authors suggest kinds of correlates that seem relevant. The end result is not quite the same as Lipset but close enough to be suggestive. The study is focused internationally, and therefore comparatively, and the "shotgun empiricism" is contained in the hypotheses and theories that follow the presentation of the statistical problem.

indicators selected as resource relevant. It will also rest upon the empirical consistency of the over-all correlation. It need hardly be added that there is considerable agreement as to what aspects of societal industrialization are in fact resource relevant.

Finally, the use of multiple operational indicators or indexes for the master variables must not be confused with the idea of "multiple causation"--a notion resting upon poor semantics--for in the general sense industrialization is the "cause."³⁴ And since no weights will be assigned to the indicators, multi-variant analysis is ruled out. In other words, I am seeking a broad, general correlation and that is all.

Let us now consider whether the hypothesis that I have suggested can be placed in the framework of a still wider explanation. Will my theory, if proven correct, add additional confirmation to a master hypothesis of industrial organization?

³⁴ Morris R. Cohen and Ernest Nagel, An Introduction to Logic and Scientific Method (Harcourt, Brace & Co., 1934), pp. 269-71. The multiple causality and the "plurality of causes" contention is one social scientists might well get disabused of in a hurry. It is tempting in social theory to construct multiple causes but as Cohen and Nagel show it is also totally inadequate for explanation or prediction. It is another example of mistaking language for reality.

Beyond the correlation of industrial society with resource control there are a number of sociological hypotheses that appear relevant as a framework. However, when one examines many theorists of industrial society's "main drift" such as Marx, Veblen, Schumpeter, or Polanyi he finds that they are in one way or another caught up in specifics.³⁵ In particular they are mesmerized by the capitalist market economy. And this is the case even when they are busy proclaiming its transitional and ephemeral character. None of these men had his eyes on the fundamentals of social structure as they have increasingly become apparent. Others, perhaps lesser lights, such as Maine, Morgan, Spencer, Durkheim, Toennies, and lately Becker, Redfield, and Mannheim pointed to much more fundamental notions, and did so explicitly rather than by implication.³⁶ But it remained for Max Weber

³⁵ Paul M. Sweezy, The Theory of Capitalist Development (Oxford University Press, 1942); Joseph A. Schumpeter, "The Marxian Doctrine" (pp. 1-58) in Capitalism, Socialism, and Democracy (3rd ed.; Harper & Brothers, 1950); Morton Mandell Bober, Karl Marx's Interpretation of History (Harvard University Press, 1948); Joseph A. Schumpeter, Capitalism, Socialism, and Democracy, op. cit.; Thorstein Veblen, The Portable Veblen, Max Lerner (ed.) (The Viking Press, 1958); Karl Polanyi, The Great Transformation (Rinehart & Co., Inc., 1944).

³⁶ For a compact statement covering most of the, to use Bendix-Berger's concise phrase, "paired but opposite tendencies of social action" contained in the various works of these men see: (by index) Don Martindale's unusually excellent The Nature and Types of Sociological Theory (Houghton Mifflin Co.,

to specifically crystallize the collective notions, and it continues to be Weber's work that today offers us the soundest understanding of the larger framework we are seeking.

Weber argues that the master pattern of industrial drift was characterized by increasing rationality in the formations of social life. It was the "contract" of Maine, the "civitas" of Morgan, the "industry" of Spencer, the "organic solidarity" of Durkheim, the "Gesellschaft" of Toennies, and lately the "secular" of Becker, the "urban" of Redfield, and more carefully, the "functional rationality" of Mannheim--it was these that Weber generalized in his master organizing concept of increasing rationality.³⁷

1960); and for Morgan, discussed only in passing by Martindale, see: Leslie A. White, "Lewis Henry Morgan: Pioneer in the Theory of Social Evolution," in Harry Elmer Barnes, An Introduction to the History of Sociology (University of Chicago Press, 1948), pp. 138-54. In the same volume can be found discussions of Maine, Spencer, etc.

³⁷ Weber came to the full realization of the "increasing rationality of modern society" very late in his life. There are in his works, however, several anticipations as well as overt expositions of the major notion. I realize that it is not customary to tie Weber's notion to that of the societal opposites of the men I have listed above; I believe it is a fair tie-in nonetheless.

See: Max Weber, The Protestant Ethic and the Rise of Capitalism (Charles Scribner's Sons, 1930), pp. 13-31, written just before death, this is the only concise statement. However, Weber's entire comparative sociology involved the use of the notion, and it cropped up again and again in his discussion of everything from the "rationality of the literati in China" to "rational bourgeoisie enterprise." Specifically see: Hans H. Gerth and C. Wright Mills, From Max Weber: Essays in Sociology (Oxford University Press, 1946), pp. 293-94

All the others, with the exception of Mannheim, who rests his case on Weber, produced formulations that remained erroneously polarized. Their basic notions hardly received the conceptual analysis or careful examination in terms of a range of contemporary and past social structures. Economic models too often betrayed themselves when organizational indicators should have been employed. Weber alone, it seems to me, had his fingers on the pulse of industrial reality.

It becomes increasingly clear that the type of means-ends nexus Weber saw as characterizing modern industrial orders have more and more come to pass. Such nexus broke

and elsewhere in the essay entitled "The Social Psychology of World Religions." Also, in the same book see the authors discussion of Weber's intellectual background. A few major commentators interested in the same aspect of Weber's work include: Karl Mannheim, Man and Society in an Age of Reconstruction (Harcourt, Brace & Co., 1951), p. 52, "Max Weber's whole work is in the last analysis directed toward the problem 'Which social factors have brought about the rationalistic characteristic of Western civilization'"; Reinhard Bendix, Max Weber: An Intellectual Portrait (Doubleday & Co., Inc., 1960), pp. 382-449; Talcott Parsons, The Structure of Social Action (The Free Press, 1949), here and there pp. 500-578; edited and annotated: Max Rheinstein (trans. Edward Shils) Max Weber on Law in Economy and Society (Harvard University Press, 1954), pp. 224-55, 349-56; Hans Gerth and Don Martindale (trans.), Max Weber's, Ancient Judaism (The Free Press, 1952), pp. x-xi, "Weber subsumed the development of modern capitalism under a more general Occidental process of rationalization"; H. Stuart Hughes, Consciousness and Society (Vintage Books, 1961), p. 289, "On the one hand he [Weber] was convinced that the deepest tendency of the contemporary world was toward a bureaucratization of all phases of public activity: this was the tangible manifestation of that more general process of rationalization which had distinguished the West from all other known civilizations."

with tradition, increasingly utilized empirical science and organizational rationality as the final criteria for the survival of social formations in the modern world. It is within this framework that my correlation, if verified, will fit: as one more confirming instance of a master tendency in the structure of industrial organization. It will amount to a small increment of confirmation for the larger regularity.³⁸

³⁸In conversation with Professor Faunce, he has argued (if I follow him correctly) that (a) Weber's notion of rationality can be given no separate meaning distinct from special aspects of industrialization taken individually, and (b) that if one attempts to do more than this the word becomes a metaphor with all of the logical and semantic difficulties of any metaphor.

With this I completely concur. Nor do I wish to give the impression that I expect the concept to do more than that which "a" (above) would rightfully restrict it. Therefore, a further word of clarification on the use of the notion is in order.

It seems to me that what Maine, Spencer, Morgan, etc., and Weber were looking for was some way of characterizing the major institutional alterations that have taken place in society since the industrial revolution (and events just prior to it). Unfortunately they lumped vast numbers of past situations, social forms, and institutions into inadequate residual categories when characterizing what came before the modern era. Terms such as "preindustrial," "communal," "traditional," and "pre-modern" (when referring to types of societies) and the large number of similar labels that were offered simply confused, in summary fashion, the complexity of the past. Of course, the anthropologist found this quite disturbing, in fact ridiculous. But the sociologist was interested in industrial orders and not what came before. Thus we may forgive him at least this aspect of his dichotomy, remembering however that it is in need of

remedy if we are to employ it in any useful manner in the future.

On the other hand this same group of sociologists did reach some clarity on the particular achievements of industrial institutions. Weber's notion of increasing rationality was only one of several competing terms (i.e., "contract," "cititas," "organic solidarity," etc.). But I would argue that etymologically it was one of the best, for it characterized the secularism, decline of magic, and positive employment of science in larger and larger areas of social life--even to the point of studying man himself. The use of the logic of science in solving problems--by no means all problems, of course,--is well caught in the traditional meaning of the term "rationality." A second feature, the growth of bureaucracy is, it might be argued, capable of similar analysis. Does the evidence of science support the contention that bureaucracy is the most efficient method we have for accomplishing complex and exacting tasks involving the coordination of large numbers of individual acts? If so, then this aspect of rationality is merely a special case of scientific rationality.

Frankly I do not know that this is the case, though I do know that Weber argued that it was. Even if, for the period 1850-1975 it were the most rational method of organization (i.e., the most efficient means supported by the scientific evidence) then at least for that period, if not forever, societies thus characterized were manifesting increasing rationality.

If not, that is, if bureaucracy is not the most efficient type of organization for the tasks of an industrial system, then Weber was empirically wrong and all we have left of his notion is that science (at least science, that is!) extends more and more deeply into the social fabric in the construction of our choices. But even that would not be a bad characterization of the age, certainly as good as saying, as Maine would have it, that relations are increasingly contractual.

But let us go a step further to the weakest sense of the meaning of rationality. "Rationality" may be employed merely as a term or symbol that we use to stand for a number of separate but basically unrelated events which everyone would agree have taken place since 1750 (growth of science, growth of bureaucracy, more secondary controls, etc.). Actually this is about all that my formulation implies, for

In other words, "institutionalization of rational resource control" is only another instance of the increasing rationality of industrial society. Specifically it is that instance of rationality wherein traditionalistic as well as market restraints on resources are deracinated, where the means substituted are based upon empirical science and functional rationality of organization. That this type of means-ends fit is not yet perfect, relative to existing systems of rationality, is a fact. But if the general correlation holds then Weber's major pattern of drift will have been, by that much, vindicated.³⁹

I have defined rationality to mean bureaucratic advance and the application of science. If more than that is justified, well and good, but this weak argument should offend no one.

Finally, it must be freely admitted that Weber's use of the term itself is imprecise and open to some speculation. It seems to mean "systematic" in some situations, "governed by scientific logic" in others, and perhaps something more as well, something German. I do not pretend to know the full meaning. Certainly the formulation above, as far as it goes, can find no serious quarrel with Weber's conception.

³⁹Of course, no "theory" is ever proven; it merely piles up confirming instances in its favor. We can disprove a theory, and do so conclusively. That is another problem altogether.

It is perhaps worth noting that there are other theories of resource control aimed at explanation and prediction for purposes of application. Walter Firey's, Man, Mind and Land (The Free Press, 1960) is such a work. With elaborate fanfare Firey gets out the idea that we must examine the interrelation of ecological, economic, and ethnographic features in order to adequately formulate resource policy. In spite of ponderous terminology and a

The Empirical Research Design

My hypothesis states that the explanation of rational resource control differentials (by states) is to be understood as a direct function of the industrialization of society.

How does one test such a correlation? The only possible approach is to construct operational indexes that will serve as definitions of the two major variables, and, at the same time, indicators of the appropriate data.

As noted, to get the sorts of indicators needed, historical data are clearly inadequate. It is often vague and far too time consuming. Is there another method? Clearly, there is the ecological technique. Taking the forty-eight continentally contiguous states (Alaska and Hawaii being excluded because of their recent federal status)⁴⁰

batch of Aristotlean syllogisms he only hatches a truism: i.e., we must take all factors into account. The actual job of predicting and explaining is carried on in four societies that Firey examines, and it shows, ever so clearly, that terminology or no you have to do the empirical ground work before you can predict; there is no simple "social physics" from which reality can be deduced.

⁴⁰ Alaska and Hawaii have had a long and involved history of conservation warfare. They are, however, useless for our purposes, being, until recently, under federal jurisdiction. Whatever conservation organizations exist can easily reflect this, rather than local facts and local industrialization.

an examination of the two variables will be undertaken state by state at a given dateline, falling within the five year period 1956-1961. By examining each state in terms of (a) industrialization of society, and (b) rationality of control, forty-eight comparative units will be amassed.⁴¹ If the correlations shows no major skews we may conclude that resource control differentials are a function of industrialism in (at least) one democratic, capitalistic system.

But what indexes or indicators will serve as the operational definitions of the two key variables? Let us begin with the variable "institutionalization of rational resource control."

The empirical indicators I am seeking must have the two following characteristics. First, they must indicate the empirical facts that are actually relevant to rational resource control. Whether they slop over and do a bit more than this is less important. It would be more elegant to select indicators that direct attention to precisely what

⁴¹In point of fact there will not be forty-eight states, nor, for that matter twenty-eight. Four will be eliminated because they cannot be controlled; four more because they show random variation as regards degree of industrialization; and several more because they cannot be compared--either on a continuum or as extreme pairs--due to dissimilarities in quantities of wild land in the states to be matched.

is desired and no more, but a slight sloppiness of fit will not destroy their utility if it cannot be avoided. Second, the indicators must be pragmatically researchable. That is, it must be possible to get the required data they indicate without prodigious expenditures of time, effort, and money.

To appreciate the type of indicators or indexes required it is important to define more specifically the meaning of "institutionalization of rational resource control." First, by "institutionalization" is meant (a) regular and established ways of doing things, and (b) an association that serves public rather than merely private interests, and does so in an accepted, orderly, and enduring way. Both of these meanings of institutionalization are included in my definition and indicators must respond to both features. Second, by "rational" is meant (a) the use of empirical science and general knowledge in the articulation of social means to ends (for whatever ends specified, and relative to whatever the corpus of scientific knowledge happens to be) and (b) the bureaucratization and/or professionalization of associations involved in the means-ends articulation (i.e., the construction of a rational administration of the means-ends nexus). Again, both characteristics of rationality must be included in the indicators. Third, by "resource" is meant any culturally relevant material good or satisfaction--actual

or potential--existing in the non-cultural world (natural world) that is characterized for some cultural purpose as not unlimited. Indicators of this factor I need not specifically include. They will be operationally included in the classification of associations of the cultural units (states) as concerned with resources and conservation. Since it must be such organizations that I study, no further indicator is necessary.⁴² Fourth, by "control" is meant the probability of influencing or coercively designating the disposition of resources within the cultural units (states) investigated.

If we now examine this set of definitions of the first variable we can readily see that there are five separate sorts of indicators that will be required:

1. Indicator of institutionalization in the sense of "regular and established ways of doing things."
2. Indicator of institutionalization in the sense of "an association concerned with public rather than merely private interests."
3. Indicator of "use of empirical science and general knowledge in the articulation of the administration of the means-ends nexus."

⁴² In other words I am going to use the "defined" conservation organizations as my resource units. The states classify them as such and I see no reason not to use that classification. As for private conservation organizations these can be obtained in a similar manner and will stand as defined by external agencies.

4. Indicator of "bureaucratization and/or professionalization of the administration of the means-ends nexus."
5. Indicator of the "probability of influencing or coercively designating the disposition of resources."

Taken as a group these indicators or indexes will, when they are empirically interpreted, constitute my operational definitions of "institutionalization of rational resource control." It now remains to specify the empirical interpretations of the five indicators.

These interpretations must involve "observable structures" concerned with resource control. Observable structures concerned with control fall into two types, public and private associations. The indicators listed above will be given empirical interpretations primarily in terms of public structures.

1. For the indicator "regular and established ways of doing things" the empirical interpretation may be used of (a) organizational duration, and (b) permanence of tenure of staff relative to rank and file members of the organization.

The duration of existence of an organization is certainly some evidence of its institutionalization. Two years should be adequate for organizations established within the last five; five years for organizations established within the last ten. In both instances--and so as not to

penalize fledglings--the specified durations should generally eliminate short term pressure groups concerned with ephemeral issues. Salaried and permanent staff members, as opposed to voluntary personnel, appears to be a fair device for sorting out strictly "newsletter" organizations from organized and effective professional structures. Both of these empirical interpretations of the first indicator apply especially to private associations concerned with conservation. The public sector is less likely to manifest the negative of either empirical interpretation. However, this in no way destroys the interpretation's effectiveness for the public sector and it should be included, obvious or not.

2. For the indicator of "an association concerned with public rather than merely private interests" the empirical interpretation of public definition in legitimate codes and documents may be employed. Thus constitutions, legal declarations, state statutes, and other objective sources may be utilized.

3. For the indicator "use of empirical science and general knowledge in the articulation of means to ends," one empirical interpretation will be, numbers and types of degrees in higher education held by all renumarated staff members in public resource associations. This would exclude

from consideration voluntary fire fighters in state organizations, while it would include even the manual laborer in a government fish hatchery. Other things being equal, private organizations may be expected to have fewer degree holding employees since their chief interest is influence; while public organizations, such as the State of Michigan, Department of Conservation, would have more since they involve the administrative application of empirical science and knowledge to the rational attainment of ends. The "certified degree or diploma" offers one fair and objective measure of the use of the expertise of empirical science and knowledge as contrasted with political appointment, nepotism, and patronage.

Another "sub-indicator" or "interpretation" will be the averaged (three years) absolute size of research budgets. "Absolute size" tells us how much research gets done, whereas taken as some percentage it would give a distorted picture. That is, given states with comparable forest lands to manage it would be folly to think that two deer-food research projects are better than one. They are no more likely to be better, as Keynes argued, than two railroads running side by side. Therefore it is absolute not relative amounts of research budget that are important. The issue of

federal monies and research will be resolved by keeping state and national funds separate on the questionnaire. Discussion of any bias such federal activity might give the state conservation picture must wait until the discussion of the wild land control variable.

4. For the indicator of "bureaucratization and/or professionalization of the administration of the means-ends nexus" the empirical interpretation may be confined mainly to "bureaucratic rationality" (as opposed to "professional rationality") except as evidence suggests the need for the second sub-indicator. Professionalization, as a distinct mechanism for constructing rational administrative systems, is only indirectly encountered in administrative structures of public associations.⁴³

For the major (i.e., bureaucratic) interpretation of rationality use may be made of the ratio of clerical to managers, officials, and professionals in the administrative

⁴³ Strictly speaking the above argument is arbitrary. Insofar as state bureaucracies employ, for instance, Ph.D.'s they are getting professionals and professional rationality (i.e., socialized competence in an area of task diversity--the opposite of bureaucratic rationality). To this extent professionalism, as a third type of rationality (see below) must be included in my indicators. But the same indicator as scientific rationality can serve, in this case, a dual purpose (i.e., the number and type of degrees relative to total membership in the organization). This will be discussed below in the consideration of the conservation data.

staff of public associations.⁴⁴

Stinchcombe has employed a similar index interpretation for the study of the construction industry, an industry exhibiting high manual professionalization but low bureaucratic rationality.⁴⁵ If the ratio is high it suggests an

⁴⁴The relative weights given in this study to the public and the private sectors of conservation are admittedly uneven. The reasons for this are as follows. First, I am not trying to assess the relative importance of public versus private sectors. I am only interested in some objective measure of resource control that will be comparable by states. Second, the public sector will be my main source because it appears on all accounts to have the greatest impact, both through time and proportionately. Third, most private organizations that are billed as conservation organizations are really sportsmen's clubs and specialized preservationists groups. It would be most surprising, indeed, if they manifest the structure of rationality and control that public structures do, since their chief functions are influence and lobbying. Therefore, insofar as the private sector receives attention, gross membership and similar crude indicators will be utilized.

⁴⁵Stinchcombe argues, as have several others recently (S. H. Udy, "Bureaucracy and 'Rationality' in Weber's Organization Theory: An Empirical Study," ASR, Vol. 24 [December, 1959], pp. 791-95) that Weber's notion of rationality of administration (or administrative rationality) requires dissection: one element being bureaucratic with or without professionalization and the other professionalization without bureaucratization. Files and records are employed as one of the best indexes of the split. The bureaucracy is a type of administration of many separate and distinct tasks, yet its rationality lies in the organizational structure. Not so the matter of professionalism. Socialized competence in an area of task diversity is the professional rationality. The two are not necessarily linked.

The use of files and file keepers is as good an indicator of the degree of bureaucratization as I need. See: Arthur L. Stinchcombe, "Bureaucratic and Craft Administration

association organized around files, records, and communications and therefore centralized planning, decision making, influence, and coercion can be anticipated. If it is low one may safely assume that rational planning, centralized decision making, and centralized power are unlikely. This is precisely the difference one would expect to find between a government conservation bureaucracy and a private voluntary association of hunters united by an occasional party, the yearly hunt, and a monthly newsletter. It is also the difference one would expect to find between the California Fisheries and Wildlife Department and the Arkansas Game and Fish Commission. The administration of the "means" in such diametric organizations varies accordingly.

5. For the indicator of "probability of influencing or coercively designating the disposition of resources" the empirical interpretation of gross membership in private and public associations and organizations and total state budget may be employed.

While sheer members may not always be significant of control it is certain that even small organizations, no

of Production: A Comparative Study," in Administrative Science Quarterly, Vol. 4 (September, 1959), pp. 169-87. For discussion of the same general empirical indicator see: Reinhard Bendix, Work and Authority in Industry (John Wiley & Sons, Inc., 1956), pp. 211-26.

matter how effectively structured, must gain some mass support in order to influence decisions. This is true especially for private groups. The sheer numbers, on the other hand, of employees in public structures are certain to influence events more significantly as they increase.

Of course, it is true, as Selznick has shown, that a numerically insignificant association, if effectively structured and disciplined, may have disproportionate influence.⁴⁶ This was especially true of the Bolsheviks in revolutionary Russia. But it took a period of great social unrest to advance such an organization. Within the settled political structures of Western Europe the same organization had little effect without mass support. Temperance movements are often suggested, in the United States and Canada, as evidence of the effectiveness of organized minorities. But while they were well organized they also had mass rural support making them significant minorities. In itself mass support and (concomitantly) budgets may not be the entire story, but without them, except in times of social crisis, it is unlikely that much can be accomplished. Therefore, sheer size of voluntary private associations and total number

⁴⁶ Philip Selznick, The Organizational Weapon (The Free Press, 1960; formerly published by McGraw-Hill), pp. 1-72, 275-314.

of employees in public organizations along with budgets should give us a reasonable, if not unquestionable, measure of "control."

In closing this discussion, of the empirical interpretation of the indicators of the first variable, the question of control factors again emerges. To begin with, it may appear that I will have to control the various states by population. Since there are enormous variations in population among the comparative units it would seem important to any conclusions to adjust these discrepancies. However, since population differentials are, as will be shown below, one of the indicators of "industrial society" it would mean, in effect, that I was controlling an aspect of my variable. Besides, private and public resource control associations are not designed to administer the population. Their concern is natural resources.

But the control of another factor cannot be so easily disposed of as that of population differentials. I refer to the ratio, by states, of "wild land" to land in agriculture and/or in urban areas.⁴⁷ By wild land is meant forests, swamps, sheer mountain, desert, water's edge, etc.

⁴⁷ This facet really represents a third control factor: wild land, political, and economic.

Such land is carefully classified by states and can be ascertained en toto by detailed computations from relevant sources. Now the amount of wild land in a state must be controlled for this study to have worth. This is most easily seen in the case of Iowa. In that state the land falls into one of two predominant classifications: urban areas and agricultural farm. Except for soil and farm conservation there is quite literally little basis for a conservation program or resource control movement. There would be virtually nothing (comparatively speaking) for a state conservation department to administer. Therefore, we must eliminate those states that fall below a certain ratio of wild to non-wild land. At what ratio the cut off point, for complete elimination, should be established is not yet certain. Whatever the ratio proves to be it should be picked so as to appear "reasonable" from the point of view of the known facts of that state's land and industrial-urban structure. However, for the remaining majority of states only those with roughly identical ratios of wild land to urban-agriculture will be compared.

Another reason that the wild land control is imperative is that I am deliberately excluding agriculture conservation as well as soil control from this study. This is necessary because agriculture is, by definition, a form of resource

control outside of the industrial picture (unless industrial and mechanized farming are viewed--and this is too indirect--as responses to growth of industrial population). To appreciate the effects of industrialism on resource control movements this factor must be excluded from this study, though, indeed, not from all studies of this problem. This is especially true from the point of view of a state analysis rather than a national analysis.

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Let us now turn to the other master variable "industrial society." Again one must define what is meant in order to facilitate the search for indicators. However, at this point a problem arises. Whereas, resource control was relatively limited, it is a truism that industrialism is a sweeping and highly diverse phenomenon. Therefore, what we must search out is neither a definition of those entities in the extension of the term as a whole, nor what logicians call a "real definition" of the meaning of the idea in all respects. What we must have instead are only those aspects of industrial society that are particularly resource relevant.⁴⁸

⁴⁸The factors I select will stand in about the same relation to my study as Clark Kerr's-Siegle's "explanations" and "theories examined" stand to their discovery of the differentials in propensity to strike in various industries, see: "The Interindustry Propensity to Strike--An International Comparison," op. cit.; and the general discussion of the

Now clearly not all aspects of the impact of industrialism on society are resource relevant. Kinship, for instance, seems to have severely altered, in the course of industrialization, without registering a resource impact. It may be possible to argue that had extended families persisted the pattern of tract homes, for instance, would have created sharp differences in land use. And some would even argue that the nuclear family is by no means always an accompaniment of industrialization (i.e., Japan). Nonetheless there does seem to be a fairly general correlation, given enough time. But even if tract homes had been differently organized, farmland differently processed, there is general agreement that the alteration in kinship incident upon industrialization has not had a major role in the determination of resources.⁴⁹

meaning of the relation between economic development and democratic stability in S. M. Lipset's "Economic Development and Democracy," op. cit.

⁴⁹There is considerable controversy over the relation of kinship to industrialization. That is enough to disqualify it for my use. See for instance: Eugene Litwak, "Geography, Mobility and Family Cohesion," American Sociological Review, Vol. 25 (June, 1960), pp. 385-94; also by Litwak see: "Occupational Mobility and Family Cohesion," American Sociological Review, Vol. 25 (February, 1960), pp. 9-21; and for a quite recent treatment of the entire problem, one, in fact, throwing doubt on the very correlation of nuclear families and industrialism see: Sidney M. Greenfield, "Industrialization and the Family in Sociological Theory,"

The increase in the division of labor is another aspect of the process of industrialization that seems to have little resource relevance, unless one uses it as an indicator of industrialism--a very different thing.⁵⁰

A shift to an associational type society is again of little direct meaning to resource use, unless, again, it is taken as an industrial indicator.⁵¹

And finally, a shift from sacred to secular orientations in daily decisions has had little resource relevance. Of course, if any of these changes are viewed as indicators of the industrialization of society then, by definition, that indicator is going to have an impact if the correlation holds at all.⁵² But in themselves they are not vitally relevant.

The American Journal of Sociology, Vol. LXVII (November, 1961), pp. 312-22. Japan has been the source of much similar research with its persistence of dozoku and other forms of "fictive kinship" in the process of industrialization.

⁵⁰ It is difficult to cite sources for the obvious. Only Marx argued that there could be an industrial order without division of labor. So grotesque is this formulation that it seems wiser to cite it than the mountain of comment on the necessity of a division of labor in industrial society. See: Karl Marx, The German Ideology (International Publishers, 1939), p. 22. And so uncertain was Marx of his own formulation that he never bothered to develop it.

⁵¹ There is an embarrassment of riches regarding this issue: Cooley, Maine, Morgan, Redfield, Weber and a dozen others.

⁵² This was one of Redfield's main contentions as well as many others. See: Robert Redfield, "The Folk Society," American Journal of Sociology (January, 1947); Becker argued

Having listed four common--if not universal--features of industrialism that do not appear resource relevant, it remains to specify some features that in fact are.

I have in mind four basic alterations that have occurred in the structures of societies under the impact of industrialization. Thus far I have not encountered critical opposition to viewing these features as "caused" or constantly correlated with the industrialization of society. Furthermore, they appear to me to be highly resource relevant. If they are not my correlation would be meaningless. But insofar as there is general agreement that these factors of industrialization are resource relevant, then, there is, by that much, reason for accepting them as the probable cause of the resource movement. There will also be the evidence of any serious study that has been concluded concerning their resource utilization--and there have been many--plus the inductive evidence of the general correlation I am attempting to establish in this dissertation.

The "deductive probability" of my chosen factors of resource relevant industrialization actually amount to the "micro-analysis" of which I spoke while discussing the Chief

that they could change back and forth (sacred and secular) but the same general point was involved. And the growing disenchantment has been the theme of many writers in sociology (and out) when viewing industrial societies.

Features of the empirical problem. It is this aspect that amounts to the "purely verbal"--causal tie-in between industrial society and resource control. What I will end with in this study is a general correlation only. The specific causal analysis will rest on the probability of the industrial indicators being in fact resource relevant.

These indicators must, again, be observable phenomena. They should, again, be actually relevant to resource use. And if a bit sloppy they should at least cover what is germane to this study. Finally they should be pragmatically researchable.

They are:

1. Indicator of growth in "size and concentration of industrial organizations of economic production."
2. Indicator of growth in "size and concentration of urban political units."
3. Indicator of growth in "size and concentration of gross population."
4. Indicator of "increase in wealth per capita."

Taking these features of the impact of industrialization on society as resource relevant we can see that corresponding sub-indicators are required. These sub-indicators are simply the feature in question given an empirical interpretation.⁵³

⁵³Another possible variable that may appear important is the taxation differentials by states. This matter will be taken up (below) previous to the discussion of the conclusions to the empirical findings.

The empirical interpretations given these indicators are as follows:

1. For the indicator, growth in "size and concentration of industrial organizations of economic production," the following interpretations may be employed. First, the absolute number of economic enterprises employing 500 or more employees, by states, coupled with the ratio of small businesses (8-19 employees) to large, by states. Second, the assessed valuation of industrial and commercial properties. Third, percent of the states population in the non-agriculture workforce and the percent in primary and secondary versus tertiary industries. The reasons for employing the first indicator should be obvious in terms of my hypothesis. The last two are selected because the degree of industrialization of a society--or a state--in every study I know is directly related to the size of and degree of concentration of economic organizations.⁵⁴

2. For the indicator growth in "size and concentration of urban political units" the following interpretations will

⁵⁴See, for instance: Admantior Pepelasis, Leon Mears, and Irma Adelman, Economic Development (Harper & Brothers, 1961), pp. 3-17; also, Benjamin Higgins, Economic Development (W. W. Norton & Co., Inc., 1959), Parts 2 and 3; A. A. Berle, Jr., Power Without Property (Harcourt, Brace & Co., 1959), in which the old master of economic concentrations reiterates his views and adds further fuel.

be employed. First, total number, by states, of cities 50,000 population and over, together with breakdown, by states, of number of cities falling in specified size sub-classes. Second, total number of Standard Metropolitan Statistical Areas, by states, plus percent of population residing within and without SMAS's. Third, percent of total population classified as rural, by states. Fourth, two additional sub-indicators concerned with water use in municipal areas and sewage disposal problems by municipal areas.

3. For the indicator growth in "size and concentration of the gross population," the following interpretations will be employed. First, gross population figures by states. Second, automobile registrations by states. Third, fishing licenses sold (absolute and relative numbers as well as out-of-state), by states. Fourth, hunting licenses sold (absolute and relative as well as out-of-state), by states. The last three interpretations are utilized because of the sense (see below) in which the population (as a market and a recruitment source) is conceived in this study.

4. For the indicator, increase in "wealth per capita," the empirical interpretation of per capita personal income, by state, will be employed, together with a general graph dealing with the relation among personal income, travel, and leisure

as they impinge on outdoor recreation. Since this latter aspect involves exactly what is important regarding personal income, it will serve as a useful summary device.

Once I have established a continuum of states based upon these industrial sub-indicators of the four major indicators, I will be in a position to correlate them with the indicators of resource control. Before leaving this discussion of the empirical design, it is important to understand exactly why each of the industrial society indicators were chosen as having a high probability of resource relevance (i.e., a discussion of the causal connection between the two master variables at the "micro-level").

The causal probability of my industrial correlates rests upon the likelihood of their involving the entire range of non-agricultural resource use. If they cover more than this range, no great harm is done; if they cover less, they are inadequate. A correlation in itself is a significant fact; but the desire in turn to explain the correlation is appealing.

We noted that many features of industrialism were without resource relevance, but we went on to isolate four factors that were. The size and concentration of economic units of production was chosen for the following set of resource relevancies. Industries require basic raw materials

such as metals, chemicals, wood pulp, timber, concrete, and the entire range of fabrication materials. There are also the basic service needs of waste disposal, sufficient water for processing, water transport, and energy. Lately, the air pollution as well as stream pollution problems have complicated this picture. Thus in the entire spectrum of materials ranging from renewable to non-renewable resources, industry is directly concerned. The importance of size and concentration factors rests upon the question of perception of resources base and the likelihood of oligarchic monopoly. The chief point seems to be that the larger the enterprise, and the more concentrated the industry, the greater likelihood of perceiving the need to plan and the greater likelihood of the organization attaining economic security. Large size and concentration mean a broader overview, a greater probability of understanding the need for long range calculation, greater probability of monopoly, and thus greater appreciation of the limitations of any resource base. On the other hand the smaller the concern, the less likely is this sort of consideration to emerge.

Problems of sufficient raw materials, water, waste removal, transport, and energy--each of these, and others, are crucial to rational planning. Rational planning is a necessary feature of all large scale operations. Therefore,

resource concern should be manifest by such organizations. Naturally some of this concern will be national and international. Nonetheless, what is available at the states level will be of definite interest. The automobile industries have long shown concern for the metal and fuel resources in Michigan, and not a little of their interest in this state was centered around the Great Lakes coal, iron, copper, and water transport potentialities.

This is not to say that industry will back conservation in general. But those aspects relevant to its particular industrial resource base will get attention.

Turning to the indicator size and concentration of urban political units, the chief resource uses are those of water supply, waste disposal, air (and its pollution) and energy. By focusing on the growth of political entities we get into somewhat the same problem of planning and perception (and "state" monopoly) that we discussed in industry. Beyond a certain size and concentration point, it is safe to say, water and waste disposal are seen as the urban problems. California is at present involved in a water project for the urban south that makes the Panama Canal pale by comparison. The Chicago waste disposal and water problem has plagued the Great Lakes states for years since it involves a basic

disposal-water use dilemma. Political communities, as distinct from mere population aggregates, are organized (like monopolies) to act on such issues. Modern history in urban places has demonstrated that this action is forthcoming as soon as the perception of the problem increases. This increase is a function of size and concentration of municipal polities.⁵⁵

The huge recreation arm of conservation is covered mainly by the size and density of population indicator. Recreation is a multi-billion dollar national business and ranks third only to automobiles and agriculture in Michigan. As in the case of production industries it is necessary to indicate the groups concerned with its persistence and the resources upon which it relies. From the point of view of population these groups fall into two classes with respect to their interest in population: those concerned with markets and those concerned with recruits. In both instances the concentrated populations are the market targets and advertising targets as well as the source of recruitment.

Groups concerned with mass markets and with mass

⁵⁵ Marion Clawson, R. Burnell Held, Charles H. Stoddard, Land for the Future (The John Hopkins Press, 1960), pp. 51-123 and bibliography.

advertising include: hunting, fishing, and camping equipment companies; service industries related to these outdoor activities such as restaurants, taverns, hotels, motels, gasoline companies, and merchants; liquor, beer, and soft drinks and their advertisers; outdoor advertising and the (non-stalking) sporting goods manufacturers. Also in the category of mass markets are the local magazines and TV shows that find rich sources for feature articles in outdoor recreation and vacations, not to mention newspapers and "outdoor" magazines concerned with hunting, fishing, and camping exclusively. In this list must be included tourist bureaus, tourist agencies, and the AAA; the market for skiing and a hundred similar recreations and their service industries; the automobile companies and tire companies that everywhere out-Michelin Michelin in thoroughness of travel instigation. On the other side of the use of population for market purposes is the use of population for recruitment for various programs: the CCC, three generations of Boy Scouts, summer camps and municipal boys camps, physical education organizations, organized nature groups, lodges and resorts, and the William O. Douglas ideologists.

What all these diverse groups--and many others not mentioned--have in common is that they are found mainly in the great population centers of the United States. Advertising,

sales, and recruitment drives are aimed at urban areas and it is suggestive that the mass support for private conservation organizations comes from the densely populated sectors of the United States.

As to the resources such populations exploit, with their duly purchased objects of manufacture and their certificates of membership, the following may be mentioned: campgrounds, state parks, roadside parks, ski lodges and slopes, resorts, beaches, wildlife, aquatic life, sheer mountains, streams, lakes, color tour routes, "unspoiled" building sites, hiking trails, pack trails, "wilderness areas," game reserves, forests, historic sites, "recreation areas," green belts, swamps, and "scenic attractions."⁵⁶

Finally, the increase in wealth per capita is again directly related to many of the political community resource uses (water, wastes, etc.) and also to recreation land use. Increases in income carry with them increased leisure and increased means of locomotion. With advances in leisure and transport the recreation features of otherwise remote areas

⁵⁶ Ibid., pp. 3-19, 124-93, 412-39; also see: Marion Clawson, Statistics on Outdoor Recreation (The John Hopkins Press, 1958), H. Martin and Esther S. Neumeyer, A Study of Leisure and Recreation in Their Sociological Aspects (A. S. Barnes & Co., 1949); Eric Larrabee and Rolf Meyersohn, Mass Leisure (The Free Press, 1958).

suddenly become real. Skiing is a striking example of a recreation industry directly related to wealth. Others such as surf fishing, skin diving, water skiing, boating, canoeing, sailing, fishing, hunting, even smelt dipping, and dozens of others are equally striking.⁵⁷

In this discussion of the industrial society indicators it is clear that the major resource areas have been covered. Water, air, minerals, hiking trails, parks, forests, energy, lakes, scenery, streams, water transport, mountains, wildlife, fish, and a dozen other resources are contained in one form or another in the use bases of the four industrial indicators. If population is more than a giant target for bazaars, if industries are more than resource converters, if communities are more than drainpipes, and wealth more than idle hours and fast cars, it is also true that they are at least these things.

⁵⁷See: Mass Leisure, op. cit., esp. pp. 145-97, 281-304; Land for the Future, op. cit., pp. 124-93, and bibliography in this latter book for all the key variables.

CHAPTER III

THE EMPIRICAL DATA AND INTERPRETATION

We turn now to the empirical evidence which will give body to the research design. The quantitative data upon which this dissertation rests may, for convenience, be divided into three major and two minor categories. In reviewing and interpreting these materials I will follow a systematic pattern, beginning with a minor group of materials, followed by the three major categories of data, and ending with a consideration of the remaining minor category. The first minor category will review data on state parks. This is a fairly important piece of evidence for it demonstrates, in microcosm, several of the dissertation's chief points.

The next task will be to consider the major categories of data, of which there are three. The first is concerned with establishing the rank order of the forty-eight states as regards their "resource relevant degrees of industrialization." Here I will first examine a general summary table, followed by a discussion of the thirteen sub-tables which went into its construction. These thirteen sub-tables constitute the empirical interpretations of the four chief

indicators of industrialization: economic organization, urbanization, population, per capita wealth.

The second major area is concerned with establishing the absolute amounts of "wild land" found within each state. This, as was noted, is necessary as a control factor in comparing the various conservation activities.

The third major area is concerned with establishing the rank order of "institutionalization of rational resource control," by states. This will be approached by examining three summary tables and then by a verbal analysis of the individual public and private state findings.

Finally, the second minor data table, concerned with taxation differentials by states, will be examined to assess the role of tax structures and tax capacity as it impinges upon conservation activities.

Data on State Park Systems

The United States Department of Commerce (Bureau of the Census) keeps records of the number, size, annual visits, and total state expenditures on state parks by each of the fifty states. If we examine (see Table 1) this table (with the states ranked on the total acreage set aside in state parks) a number of important points leap into focus. In many ways this table constitutes a microcosm of the general

Table 1. Rank order of number of acres in state parks, by states, together with annual visits and annual expenditures, 1959.

States	Acreage	Visits (1,000)	Expenditures (\$1,000)
New York	2,701,199	34,990	18,646
California	677,007	22,196	21,757
Maine	204,361	616	303
Michigan	181,965	19,975	2,162
Pennsylvania	166,116	21,169	3,717
Wyoming	152,005	463	31
Tennessee	131,325	3,789	1,981
Minnesota	99,533	2,935	822
Ohio	92,069	17,763	4,175
South Dakota	91,000	4,550	395
Kansas	90,491	2,785	1,105
Missouri	73,775	4,962	1,113
Washington	73,195	7,065	1,855
Florida	72,737	3,260	1,091
Texas	62,301	6,269	614
Georgia	60,083	3,172	760
Oregon	59,490	10,836	1,981
Oklahoma	53,762	9,149	2,138
South Carolina	45,972	3,068	348
Indiana	43,723	3,011	1,245
New Hampshire	43,034	2,219	1,471
Illinois	42,772	8,447	3,467
Alabama	42,691	2,846	390
West Virginia	40,711	1,971	1,186
North Carolina	36,268	1,571	753
Iowa	29,715	7,359	1,359
Nebraska	28,213	3,662	381
Virginia	24,364	1,171	301
New Jersey	22,801	4,772	1,996
Connecticut	21,297	4,828	1,089
Arkansas	19,114	2,023	468
Wisconsin	19,106	5,844	609
Kentucky	19,018	4,421	2,409
Idaho	17,465	687	117
Maryland	16,855	4,712	671
Mississippi	13,635	988	316
Massachusetts	13,516	7,226	2,695
Louisiana	12,218	1,611	514

Table 1. Continued.

States	Acreage	Visits (1,000)	Expenditures (\$1,000)
Nevada	9,895	70	65
Rhode Island	8,425	2,604	587
Vermont	8,055	668	192
Utah	7,030	500	66
Colorado	6,964	314	136
Montana	6,490	320	99
New Mexico	5,387	1,003	185
North Dakota	4,393	437	109
Delaware	3,745	468	130
Arizona	4	3	43

Source: Statistical Abstract of the United States, United States Department of Commerce, Bureau of the Census, 1961, Table 254, p. 192.

relation between industrialization and conservation. Since, however, state parks are concerned primarily with recreation and preservation the other major arm of resource control (raw materials) is hardly represented. Nevertheless, the table is instructive as far as it goes.

It is clear from even a cursory examination of Table 1 that a close relationship exists between the industrial states (Table 2) and the number of visits and amount of money spent on the park system of a given state. For while there are non-industrial states with large park systems (Maine, Wyoming, South Dakota) the pressure on these systems as measured in annual visits is scant and the state

expenditures extremely low. Maine, for instance, with nearly forty million more acres in state parks than Pennsylvania, has less than one-thirty-fourth the visitors and expends less than one-twelfth the monies that Pennsylvania allocates. Both Maine and Pennsylvania are eastern states (thus obviating the effects--if any--of large federal holdings) and they have virtually similar amounts of wild land (see Table 16, below).

Mississippi and Massachusetts exhibit a similar pattern: though they maintain similar acreages in state parks the differences in visitors and expenditures is quite remarkable. Tennessee and Ohio show striking differentials, as do Iowa and Massachusetts--even allowing that the latter pair have identical land areas and that the acreages in parks is biased against the hypothesis.

Here then is a first approximation, concerned with recreation and preservation, that seems to bear out the hypothesis of this study.

Summary Table: Industrial Society

In constructing the empirical design of this study (above), I selected, for special consideration, four aspects closely related to the general industrialization of society. And as was suggested in that general discussion, one or more

(generally the latter) "sub-indicators" or "empirical interpretations" would have to be assigned to these four master aspects of the first major variable. If one examines the discussion of these indicators he will find that a total of thirteen specific empirical interpretations have been assigned the four basic indicators, and that these thirteen interpretations constitute the operational definition of the industrial society variable. It follows, therefore, that if, for each of the thirteen empirical interpretations, the forty-eight states are (a) ranked in a series of thirteen continua ranging from highest to lowest, (b) if these continua are divided into thirds, and then (c) arranged according to the total number of empirical interpretations which each state exhibits falling (whether completely or largely) within the top, middle, or bottom thirds of the continua--if this operation is performed, a systematic summary of the resource relevant degrees of industrialization will have been established. This summary constitutes Table 2.

Notice that if a state falling under say, the "Highly Industrialized" third has a total of thirteen indicators (i.e., empirical interpretations or sub-indicators) it has (qua this definitional scheme) the maximum degree of industrialization possible, while if it has only eight

Table 2. Rank order of states "highly industrialized," "moderately industrialized," and "least industrialized" as summarized for all industrial society indicators. States ranked by the total number sub-indicators falling into each third of the total rank order. Table excludes states exhibiting random variation.

HIGHLY INDUSTRIALIZED STATES	Highly Industrial- ized Indicators	Moderately Industrial- ized Indicators	Least Industrial- ized Indicators
New York	13	0	0
Illinois	13	0	0
California	13	0	0
Ohio	13	0	0
Pennsylvania	13	0	0
Michigan	13	0	0
New Jersey	11	2	0
Texas	11	2	0
Indiana	11	2	0
Wisconsin	11	2	0
Massachusetts	11	1	1
Missouri	9	4	0
Florida	8	4	1
Connecticut	8	3	2
MODERATELY INDUSTRIALIZED STATES	H-I-I	M-I-I	L-I-I
Kansas	0	12	1
Louisiana	0	11	2
Colorado	2	10	1
Oregon	1	10	2
Oklahoma	0	10	3
Kentucky	1	9	3
Washington	4	9	0
Tennessee	3	8	2
Iowa	3	8	2
Alabama	2	8	3
Minnesota	4	8	1
Georgia	4	8	1
West Virginia	0	8	5
South Carolina	0	8	5

Table 2. Continued.

LEAST INDUSTRIALIZED STATES	H-I-I	M-I-I	L-I-I
North Dakota	0	0	13
Idaho	0	0	13
South Dakota	0	1	12
Vermont	0	1	12
New Mexico	0	1	12
Maine	0	3	10
Montana	0	3	10
Wyoming	1	2	10
Delaware	2	1	10
Mississippi	0	4	9
New Hampshire	1	3	9
Arizona	1	3	9
Nevada	2	2	9
Arkansas	0	5	8
Utah	1	4	8
STATES EXHIBITING RANDOM VARIATION	H-I-I	M-I-I	L-I-I
Virginia	5	7	1
Maryland	5	4	4
North Carolina	6	5	2
Rhode Island	2	5	6
Nebraska	0	7	6

Source: Summaries of "industrial society" sub-indicators.

(as, in this case, Florida which has four in the "moderately industrialized" and one in the "least industrialized" thirds of the continua), then it has the minimum requirement for consideration as an industrial state. At any rate no fewer than eight interpretations must fall within one of the thirds to qualify for consideration in this study. If less than this number are concentrated in any one continuum-third the state is eliminated from all consideration. It will be noted that five states, exhibiting such random variation, are so eliminated.

No attempt is made to weigh the importance of the various factors or interpretations. I know of no such criteria in the resource literature nor do I propose to attempt the formulation of a set of criteria. I have however, attempted to pick interpretations that are both sociologically reasonable and resource connected. And I have attempted, insofar as possible, to select, as my states to be investigated, the least ambiguous states, that is, those having the greatest number of sub-indicators falling within each of the major continuum thirds.

The reader is advised to consult this summary table frequently in appraising the legitimacy of any state's claim to being "high," "low," or "middle" on the industrial

variable. It should also be kept in mind that five states have been, by virtue of this summary, eliminated from consideration. Other borderline situations (Florida) may be considered as virtually eliminated because of their ambiguous status.

Indicator: Economic Organization

Table 3. This is the first empirical interpretation concerned with the indicator "size and concentration of economic organizations of production." I will use a total of three interpretations in attempting to specify this aspect of the major variable. Table 3 is concerned with the total number of large business establishments (500 or more employees) in each state and the ratio of large to small businesses (8-19 employees). The importance of this table resides in the fact that it specifies an important aspect of my hypothesis: the relationship between size and concentration of an organization and the perception of that organization's resource base. In general the states which fall in the highly industrialized third of the summary table show, as well, the greatest number of big businesses and generally a strong tendency to reduce the ratio of large to small businesses. This is especially the case if we keep in mind the absolute amounts of land in the several states--a key

Table 3. Number of business establishments by employee size of 500 and over (1959) ranked by states, and ratio of establishments 8-19 employees to 500 and over employees. (Ratios computed by author.)

States	Estb. 500+	Ratio: 8-19 to 500+
New York	967	52:1
Pennsylvania	683	39:1
Illinois	636	42:1
Ohio	616	38:1
California	593	68:1
Michigan	407	41:1
Massachusetts	351	42:1
New Jersey	345	43:1
Texas	286	89:1
Indiana	246	45:1
Connecticut	202	33:1
Wisconsin	197	51:1
Missouri	185	64:1
North Carolina	180	59:1
Georgia	154	63:1
Tennessee	140	58:1
Maryland	136	53:1
Florida	126	117:1
Alabama	124	57:1
South Carolina	123	40:1
Virginia	123	79:1
Minnesota	119	74:1
Louisiana	98	81:1
West Virginia	80	53:1
Washington	77	93:1
Kentucky	75	86:1
Iowa	67	109:1
Rhode Island	52	46:1
Oregon	50	99:1
Oklahoma	49	134:1
Colorado	46	108:1
Kansas	42	141:1
Maine	39	61:1
Arizona	38	86:1
Arkansas	37	110:1
New Hampshire	33	50:1

Table 3. Continued.

States	Estab. 500+	Ratio: 8-19 to 500+
Delaware	30	42:1
Nebraska	30	125:1
Mississippi	30	142:1
Utah	24	99:1
Nevada	16	56:1
New Mexico	14	183:1
Idaho	12	161:1
Montana	12	165:1
Vermont	10	112:1
Wyoming	3	370:1
South Dakota	3	583:1
North Dakota	1	1,568:1

Source: County Business Patterns, United States Department of Commerce, First Quarter, 1959, Part 1, p. 14 (see: "State Totals").

factor for our consideration in comparing the states. Thus we find North Dakota--generally the lowest on all industrial indexes--with a ratio of one big business to every 1,568 small businesses, as contrasted with Connecticut's one big business to every 33 small businesses. If we remember also that the small businessman was pictured, by the populist historians, as the backbone of the conservation movement, the states which today exhibit such patterns cast severe doubt on this proposition.

Table 4. Since there is generally agreed to be a close relationship between the degree of industrialization and corporate concentration, that is, between the centralization

Table 4. Gross assessed value, by states, of locally assessed taxable real property 1956: commercial and industrial property, in rank order.

(units of \$1,000,000)	
New York	12,860
Illinois	5,702
California	5,093
Ohio	3,633
Pennsylvania	3,495
Michigan	2,950
Massachusetts	2,490
New Jersey	2,056
Wisconsin	1,993
Texas	1,384
Connecticut	1,366
Florida	1,282
Missouri	1,224
North Carolina	1,184
Maryland	1,053
Indiana	832
Virginia	721
Tennessee	558
Minnesota	528
Colorado	520
Louisiana	486
Rhode Island	485
Kentucky	471
Iowa	444
Washington	437
Georgia	398
West Virginia	382
Alabama	369
New Hampshire	319
Oregon	312
Kansas	274
Maine	260
Nebraska	258
Delaware	250
Oklahoma	247

Table 4. Continued.

(units of \$1,000,000)	
<hr/>	
Nevada	131
South Dakota	123
Vermont	114
Mississippi	108
Arizona	106
Utah	99
Arkansas	86
Montana	72
Idaho	64
New Mexico	60
South Carolina	57
Wyoming	51
North Dakota	38

Source: Statistical Abstract of the United States, United States Department of Commerce, Bureau of the Census, 1961, Table 545, p. 417.

of corporate wealth and a nation's economic development, this table is useful in confirming the general pattern of concentration adumbrated in Table 3 (above). The gross assessed value of locally assessed taxable real property in commercial and industrial use is a sub-indicator useful for defining degrees of industrialization, and indirectly therefore, economic concentration. If I had controlled these figures in Table 4 by constructing them in relation to total land area the concentration would have been even more apparent. Thus Delaware emerges in a strange position.

Table 5. This table is concerned with yet another aspect of the concentration of economic units, by states.

Table 5. Ranked percent of total population in non-agricultural workforce (annual average), for 1960. And percent of workforce in primary (extractive) and secondary (manufacturing) as opposed to tertiary (service) industries (computations by author).

States	% workforce non-agriculture	% primary and secondary
Massachusetts	37.1	47.
New York	36.8	42.
Nevada	36.1	25.
Connecticut	36.0	54.
Delaware	34.5	42.
Rhode Island	33.7	50.
New Jersey	33.1	52.
Pennsylvania	32.8	52.
New Hampshire	32.2	54.
Ohio	32.1	52.
Missouri	31.2	43.
California	31.2	40.
Indiana	30.9	53.
Illinois	30.8	49.
Wisconsin	30.0	53.
Michigan	29.8	50.
Utah	29.6	36.
Wyoming	29.3	41.
Colorado	29.1	35.
Maryland	28.9	43.
Oregon	28.6	42.
Washington	28.6	39.
Maine	28.5	49.
Minnesota	27.1	42.
Nebraska	26.9	33.
Vermont	26.8	47.
Georgia	26.3	45.
Florida	26.3	32.
North Carolina	26.1	53.
Texas	26.1	45.
Tennessee	25.7	45.
Virginia	25.5	43.

Table 5. Continued.

States	% workforce non-agriculture	% primary and secondary
Kansas	25.5	39.
Arizona	25.3	46.
Oklahoma	24.9	36.
New Mexico	24.9	31.
Montana	24.7	34.
West Virginia	24.6	53.
Iowa	24.6	39.
South Carolina	24.3	53.
Louisiana	24.1	40.
Alabama	23.6	46.
Idaho	23.3	37.
Kentucky	21.4	45.
Arkansas	20.6	41.
South Dakota	20.4	26.
North Dakota	19.6	25.
Mississippi	18.2	43.

Source: Statistical Abstract of the United States, United States Department of Commerce, 1961, Table 280, p. 211, Table 281, p. 212, respectively.

By examining the relative percentage of the total state workforce (as compared with total population of the state) in non-agricultural pursuits, and then coupling this with the relative percentage of the workforce in the extractive (primary)--manufacturing (secondary) industries as opposed to the service (tertiary) industries, an even more sensitive indication of the industrialization-resource linkage can be demonstrated. Since it is generally the primary and secondary industries that utilize natural raw materials, and since the

tertiary industries are less directly involved and generally smaller, the figures again demonstrate, in their rank order consistency, the relations shown in Tables 3 and 4.

Indicator: Urban Administrative Units

Table 6. Turning now to the interpretations of "urban units of political administration" five tables supply these data. The first, Table 6, summarizes the findings of the 1960 United States Census. The states are ranked according to the total number of cities they contain with population of 50,000 or more. These in turn are broken down into the various size units in which the cities, within a given state, fall. Once more, when viewing cities as political organizations capable of acting, the same argument of perception as related to size and concentration is maintained. Cities as energy, water, air, and waste disposal users are prime resource converters. Furthermore, unlike mere population aggregates, they are structured to act on these primacies. Again the close connection between the top, middle, and bottom groups of states in the several tables is quite apparent.

Table 7. Pushing the relationship between urban units and resources one step further, an examination of the

Table 6. Rank order, by states, of total number of cities of 50,000 population and over, together with breakdown, by states, of cities falling within each of the following ranges: 50,000-100,000; 100,000-250,000; 250,000-500,000; 500,000-1,000,000; 1,000,000 and over (1960).

States	Total Cities 50,000 and over					
	50,000-100,000	100,000-250,000	250,000-500,000	500,000-1,000,000	1,000,000+	
California	41	27	9	2	2	1
Texas	21	10	6	2	3	0
Pennsylvania	21	16	1	0	1	1
Massachusetts	20	15	4	0	1	0
Ohio	18	10	2	4	2	0
Michigan	17	12	4	0	0	1
New Jersey	17	11	4	2	0	0
Illinois	15	12	2	0	0	1
New York	15	7	5	1	1	1
Florida	10	6	2	2	0	0
Connecticut	10	6	4	0	0	0
Indiana	9	3	5	1	0	0
Virginia	9	4	4	1	0	0
Wisconsin	7	5	1	0	1	0
North Carolina	7	4	3	0	0	0
Iowa	7	6	1	0	0	0
Missouri	6	4	0	1	1	0
Alabama	6	3	2	1	0	0
Georgia	6	3	2	1	0	0
Louisiana	5	2	2	0	1	0
Minnesota	4	1	1	2	0	0
Rhode Island	4	3	1	0	0	0
Tennessee	4	0	3	1	0	0
Washington	3	0	2	0	1	0
Oklahoma	3	1	0	2	0	0
Kansas	3	0	2	1	0	0
Kentucky	3	2	0	1	0	0
Colorado	3	2	0	1	0	0

Table 6. Continued.

States	Total Cities 50,000 and over	50,000-100,000-250,000- 500,000				
		100,000	250,000	500,000	1,000,000	1,000,000+
South						
Carolina	3	3	0	0	0	0
West						
Virginia	3	3	0	0	0	0
Arizona	2	0	1	1	0	0
Nebraska	2	0	1	1	0	0
Oregon	2	1	0	1	0	0
Utah	2	1	1	0	0	0
Nevada	2	2	0	0	0	0
Arkansas	2	2	0	0	0	0
Montana	2	2	0	0	0	0
Maryland	1	0	0	0	1	0
New Mexico	1	0	1	0	0	0
Mississippi	1	0	1	0	0	0
Delaware	1	1	0	0	0	0
New						
Hampshire	1	1	0	0	0	0
Maine	1	1	0	0	0	0
South						
Dakota	1	1	0	0	0	0
Vermont	0	0	0	0	0	0
Wyoming	0	0	0	0	0	0
Idaho	0	0	0	0	0	0
North						
Dakota	0	0	0	0	0	0

Source: The Municipal Year Book, Orin F. Nolting, et.al. (eds.)
 (The International City Managers' Association, 1961),
 Table III, pp. 43-46, Table V, pp. 84-90.

Table 7. Rank order of number of Standard Metropolitan Statistical Areas (1960), by states. And percent of total population residing inside SMSA (computed by author). (Overlapping SMSA counted for all states.)

States	# of SMSA	% of total population residing inside SMSA
Texas	20	63.3
Ohio	15	69.5
Pennsylvania	12	77.8
Massachusetts	11	85.2
California	10	86.4
Connecticut	10	77.5
Michigan	10	73.1
Illinois	8	76.9
Indiana	8	48.0
New York	7	85.5
Georgia	7	46.0
Alabama	7	45.5
Iowa	7	33.2
New Jersey	6	78.9
Florida	6	65.5
Wisconsin	6	46.2
North Carolina	6	24.5
Virginia	5	50.9
Louisiana	5	49.9
Kentucky	5	34.1
Missouri	4	57.8
Tennessee	4	45.7
South Carolina	4	32.2
Colorado	3	67.9
Utah	3	67.4
Washington	3	63.1
Oklahoma	3	43.9
Kansas	3	37.3
West Virginia	3	30.9
Arkansas	3	19.0
Rhode Island	2	86.2
Nevada	2	74.3

Table 7. Continued.

States	# of SMSA	% of total population residing inside SMSA
Arizona	2	71.3
Minnesota	2	51.3
Oregon	2	50.3
Nebraska	2	37.5
Montana	2	22.5
Maine	2	19.7
New Hampshire	2	17.7
Maryland	1	78.2
Delaware	1	68.8
New Mexico	1	27.5
South Dakota	1	10.6
North Dakota	1	10.6
Mississippi	1	8.5
Vermont	0	0.0
Idaho	0	0.0
Wyoming	0	0.0

Source: The Municipal Year Book, Orin F. Nolting, et.al. (eds.) (The International City Managers' Association, 1961), Table III, pp. 43-46, Table V, pp.89-90. And for data on percent of total population see: Statistical Abstract of the United States, United States Department of Commerce, 1961, Table 11, p. 21.

"natural pattern" of cities is useful. This indicates the degree of concentration of urban units within a given area, not just their sheer number. To approach this problem Table 7 examines the Standard Metropolitan Statistical Areas, by states, in terms of their total numbers and in terms of the total population which they contain. This gives some rough indication of the "natural" concentration

of urban units unimpeded by "artificial" city boundaries. The importance of this factor is that such units have, on occasion, acted in concert on a related problem (water, in the Los Angeles area). Both the percent of the total population residing inside the SMSA's plus the comparison with Table 6 ("total cities 50,000 and over") help to convey some notion of this concentration, both in percentage figures and in the reduction of the number of cities 50,000 and over by inclusion in SMSA's (i.e., California's: 41 to 10). It should be noted in this present table that the numbers of SMSA's will not agree with the number given in the United States Census of 1960. The Census lists the total of SMSA's as 212 for the United States. My figure is somewhat above this number, since in the case of overlapping SMSA's the area in question was counted once in each state it overlapped.

Table 8. This table pursues the urban indicator once more, but from the opposite point of view, asking: what percentage of each state is rural as defined in the 1960 Census? The table aids in the confirmation of the above urban tables by establishing rank order of ruralness, from least to most. Again the data throws up a series of states that conform quite closely to the growing expectation.

Table 8. Percent of total population classified as "rural" by 1960 census (computed by author), rank order by states.

States	Percent
New Jersey	11.4
California	13.6
Rhode Island	13.6
New York	14.5
Massachusetts	16.4
Illinois	19.2
Connecticut	21.6
Texas	24.9
Utah	25.1
Arizona	25.4
Florida	26.0
Colorado	26.2
Ohio	26.6
Maryland	27.3
Michigan	26.6
Pennsylvania	28.4
Nevada	29.4
Washington	31.8
Missouri	33.4
New Mexico	34.1
Delaware	34.4
Wisconsin	36.1
Louisiana	36.7
Oklahoma	37.0
Indiana	37.5
Oregon	37.8
Minnesota	37.8
Kansas	39.0
New Hampshire	41.6
Wyoming	43.1
Virginia	44.4
Georgia	44.7
Alabama	45.1
Nebraska	45.7
Iowa	46.1
Tennessee	47.7
Maine	48.7
Montana	49.7

Table 8. Continued.

States	Percent
Idaho	52.4
Kentucky	55.4
Arkansas	57.1
North Carolina	60.4
South Carolina	58.8
South Dakota	60.7
Vermont	61.5
West Virginia	61.7
Mississippi	62.3
North Dakota	64.8

Source: Statistical Abstract of the United States, United States Department of Commerce, Bureau of the Census, 1961, Table 12, p. 22.

Table 9. Attacking the urban concentration problem from a specific resource base, Table 9 contains a list of states ranked by the municipal use of water within the states per capita, per day. Water, perhaps the single most crucial ingredient of city living and industrial manufacture, here exhibits a pattern consistent with the foregoing expectations. Since water has become such a prime necessity of city life (and manufacture) it is worth noting a few general facts about its consumption. Studies indicate that, "on a national basis municipal water use at the present time averages about 147 gallons per person, per day, but that this use varies, region by region, from 100 gallons per person, per day to as much as 250 gallons. An analysis of

Table 9. Water use by municipal systems per day (1954), by states (in 1,000,000 gallons), in rank order.

States	
New York	1,904
California	1,565
Illinois	1,248
Pennsylvania	1,150
Michigan	1,129
Ohio	949
Texas	702
New Jersey	526
Massachusetts	493
Indiana	413
Missouri	367
Wisconsin	348
Washington	332
Florida	296
Connecticut	243
Maryland	236
Georgia	224
Louisiana	204
Minnesota	193
Tennessee	188
Virginia	175
Colorado	174
North Carolina	169
Alabama	158
Oklahoma	158
Kentucky	146
Iowa	144
Kansas	146
Oregon	126
Utah	121
Nebraska	119
Arizona	105
South Carolina	100
West Virginia	82
Rhode Island	70
Maine	69
Mississippi	69
New Mexico	64

Table 9. Continued.

States	
Montana	54
Arkansas	53
Idaho	49
Nevada	38
New Hampshire	38
Delaware	35
Wyoming	44
South Dakota	25
North Dakota	18
Vermont	10

Source: Water Resources Activities in the United States, "Pollution Abatement," Select Committee on National Water Resources, United States Senate, 86th Congress, 2nd Session, Table 8, p. 8, in "Future Water Requirements for Municipal Use," 1960.

580 community water supplies, which serve 83,704,000 persons, indicate that 41 percent of this average daily per capita requirement is attributable to domestic use, 18 per cent to commercial, 24 percent to industrial, and 17 percent to public use."¹

Furthermore, if we compare the United States and Australia, two countries of roughly similar land area, in terms of a range of environments running from dry to wet, we discover that (a) rainfall is the factor having most

¹Water Resources Activities in the United States, "Future Water Requirements for Municipal Use," Select Committee on National Water Resources, United States Senate, 86th Congress, 2nd Session, January, 1960, p. 9.

influence on per capita water use in urban areas, and (b) that size of community ranks second as a key cause of differential water consumption. Thus, in six states of the United States having an annual rainfall of less than 15 inches the median per capita consumption was 210 gallons per day, but in 11 states having an annual rainfall exceeding 45 inches the per capita, per day use dropped to 119 gallons. And as between Australia and the United States the per capita consumption in communities 100,000 or less was 132 gallons per day as opposed to 150 gallons per capita, per day in communities of 100,000 and above.²

Certainly these general figures, as a delimitation of a specific resource problem, indicate the importance of the big urban and industrial states with regard to perception of the resource base. The larger the city the more likely is this problem to be accute; the more likely is it also to be perceived and acted on as a problem.

Table 10. Another related table concerned with a resource use is that of waste disposal in cities and urbanized areas. Table 10 exhibits a general rank order of relative amounts of municipal waste in terms of equivalent population by states. The big industrial states again head the list,

²Ibid., p. 9.

Table 10. Municipal sewage loads (1954) in continental United States, by states [in terms of equivalent population], in rank order.

States	
New York	9.5
California	7.3
Pennsylvania	5.4
Illinois	5.0
Ohio	4.4
Texas	4.1
Michigan	3.6
New Jersey	3.2
Massachusetts	2.8
Missouri	1.9
Indiana	1.8
Florida	1.7
Wisconsin	1.5
Virginia	1.2
Minnesota	1.2
Maryland	1.2
Louisiana	1.2
Georgia	1.2
Connecticut	1.2
Washington	1.2
Tennessee	1.1
North Carolina	1.1
Alabama	1.0
Iowa	.9
Kansas	.8
Kentucky	.8
Oklahoma	.8
Colorado	.7
South Carolina	.6
Oregon	.6
Arkansas	.5
West Virginia	.5
Nebraska	.5
Arizona	.4
Mississippi	.4
Rhode Island	.4
Utah	.4
Maine	.3

Table 10. Continued.

States	
New Mexico	.3
Delaware	.2
Idaho	.2
Montana	.2
New Hampshire	.2
South Dakota	.2
Nevada	.1
North Dakota	.1
Vermont	.1
Wyoming	.1

Source: Water Resources Activities in the United States,
 "Pollution Abatement," Select Committee on National
 Water Resources, United States Senate, 86th Congress,
 2nd Session, Table 1, p. 2.

and it illustrates once more the geometrically progressive problem as cities grow in size, not only with water but with waste disposal as well. The table gives this data in relative rank order (not absolute amounts).

Indicator: Gross Population

Table 11. Turning now to the third indicator (population) four kinds of sub-indicators or interpretations will be employed. The first, Table 11, simply presents gross population figures for the states. Since population is conceived, in this study, as an undifferentiated aggregate utilized as targets for both sellers of outdoor recreational goods and services and as recruitment sources

Table 11. Total population, by states, 1960, in rank order.

States	
New York	16,782,304
California	15,717,204
Pennsylvania	11,319,366
Illinois	11,319,366
Ohio	9,706,397
Texas	9,579,677
Michigan	7,823,194
New Jersey	6,066,782
Massachusetts	5,148,578
Florida	4,951,560
Indiana	4,622,489
North Carolina	4,566,155
Missouri	4,319,813
Virginia	3,966,949
Wisconsin	3,951,777
Georgia	3,943,116
Tennessee	3,567,089
Minnesota	3,413,864
Alabama	3,266,740
Louisiana	3,257,022
Maryland	3,100,689
Kentucky	3,038,156
Washington	2,853,214
Iowa	2,757,537
Connecticut	2,535,234
South Carolina	2,382,594
Oklahoma	2,238,284
Kansas	2,178,611
Mississippi	2,178,141
West Virginia	1,860,421
Oregon	1,786,687
Arkansas	1,786,272
Colorado	1,753,947
Nebraska	1,411,300
Arizona	1,305,161
Maine	969,265
New Mexico	951,023
Utah	890,627

Table 11. Continued.

States	
Rhode Island	859,488
South Dakota	680,514
Montana	674,767
Idaho	667,191
North Dakota	632,446
New Hampshire	606,921
Delaware	446,292
Vermont	398,881
Wyoming	330,066
Nevada	285,278

Source: Statistical Abstract of the United States, United States Department of Commerce, 1961, Table 9, p. 12.

for resource clubs, organizations, and other assorted voluntary associations, it is clear why gross population figures are presented. Again, the general rank ordering seems to hold.

Table 12. The concern in this table is with automobile registrations ranked by states. It may, at first, appear remote from my study. Actually there is a good deal of evidence establishing a close correlation between the automobile and the recreation arm of conservation.³

Since most recreational (preservationist) aspects of resource use are tied to the means of transport this should come as no surprise. Trains, ships, planes, and even buses are

³Marion Clawson, et. al., "Land For Recreation," Resources for the Future Annual Report (Resources for the Future, Inc., 1958), pp. 49-57.

Table 12. Automobile registrations, by States, 1960
(in thousands), by rank order.

States	
California	6,625
New York	4,492
Pennsylvania	3,713
Ohio	3,652
Texas	3,524
Illinois	3,302
Michigan	2,883
New Jersey	2,115
Florida	2,041
Indiana	1,678
Massachusetts	1,559
Missouri	1,415
North Carolina	1,374
Wisconsin	1,329
Minnesota	1,302
Georgia	1,219
Virginia	1,190
Washington	1,102
Iowa	1,070
Tennessee	1,067
Alabama	1,039
Maryland	1,003
Connecticut	975
Kentucky	948
Louisiana	937
Oklahoma	878
Kansas	870
Oregon	737
South Carolina	718
Colorado	710
Nebraska	553
Mississippi	527
Arkansas	500
Arizona	485
West Virginia	475
New Mexico	355
Utah	330
Rhode Island	301

Table 12. Continued.

States	
Maine	299
Montana	260
Idaho	255
North Dakota	231
New Hampshire	208
Delaware	142
Wyoming	140
Nevada	133
Vermont	122

Source: Statistical Abstract of the United States, United States Department of Commerce, Bureau of the Census, 1961, Table 758, p. 559.

generally incapable of providing the complex and specific transport required for even so simple an activity as visiting a state park. Furthermore, the American use of the automobile, quite aside from resource use, is a fact in its own right. Since it is a fact, the use of state automobile registrations as a source of data (at least for the United States--though in Europe the pattern would be somewhat different) stresses the mobility potentials for masses of resource users within the various state settings. Populations, conceived as potential markets and recruits, exercise these potentials through transport in the form of camping, fishing, hunting, vacations, scenic drives, and dozens of other kinds of outdoor use.

Table 13. One good measure of the impact of gross population is the sale of fishing and hunting licenses by states. These recreation activities not only involve their own immediate objectives (and the well stocked sporting goods markets that cater to them) but they are closely related to camping (with the wide range of goods and services associated) and the use of numerous kinds of lands and waters. Table 13 presents the data on fishing, as ranked by the absolute number of fishing licenses sold to residents (15 years and older). Coupled with this is the (1950--only date available and therefore probably changed somewhat today) non-resident population of each state buying licenses (given as percent of resident). It is worth noting that in fishing this latter figure is often quite high (up to 86% in Nevada), while with hunting this is not apt to be the case (see Table 14, below). When the absolute number of non-resident licenses is high it does have some effect on a particular state's conservation program (increased fish planting). The general opinion, however, of trained conservationists seems to be that this characteristic of the fishing picture is not an important independent variable, since it is generally associated with vacation trips of out-staters (i.e., the fisherman in question is generally passing through and does not expect phenomenal luck). Furthermore it is, in

Table 13. Rank order by states of absolute number of residents (15 years and older) buying fishing licenses, together with percent of resident population (15 years and older) buying fishing licenses and non-resident fishing licenses sold, as percent of resident.

States	Absolute # (1956)	% of resident (1950)	% non-resident to resident (1955)
California	1,303,066	12.1	1.2
Minnesota	946,155	14.2	29.9
Michigan	877,008	16.3	35.5
Ohio	838,823	13.7	5.9
Indiana	805,165	18.5	6.8
Illionis	721,041	9.9	2.2
Pennsylvania	692,801	7.8	4.8
Wisconsin	681,955	27.1	43.0
New York	677,573	5.5	5.7
Tennessee	651,624	17.4	42.0
Missouri	509,394	18.2	9.6
Texas	467,107	5.8	1.8
Kentucky	436,207	13.4	23.8
Alabama	435,351	6.7	9.3
Washington	389,503	23.5	5.7
Virginia	369,969	11.4	3.4
Oklahoma	365,196	21.9	17.2
Iowa	364,765	17.4	3.8
Georgia	337,246	4.3	1.7
North Carolina	332,539	7.6	3.3
Oregon	300,012	21.7	9.3
Arkansas	274,654	14.2	50.6
South Carolina	251,052	10.8	4.1
Colorado	237,273	23.5	39.7
Florida	226,272	8.9	38.1
Kansas	217,150	17.1	2.7
Nebraska	206,140	20.6	4.8
Massachusetts	205,207	5.7	2.8
Montana	191,903	36.3	21.5
West Virginia	184,159	20.1	4.2
Louisiana	177,631	3.8	15.7
New Jersey	142,049	2.8	7.1

Table 13. Continued.

States	Absolute # (1956)	% of resident (1950)	% non-resident to resident (1955)
Idaho	140,440	38.3	35.9
Mississippi	131,840	7.1	26.1
Maine	128,954	16.2	54.3
Utah	117,200	20.7	5.2
Wyoming	116,516	48.2	49.6
Maryland	107,949	3.3	23.5
Connecticut	100,243	4.8	4.2
South Dakota	99,028	23.5	38.9
Arizona	98,123	11.7	50.7
Vermont	81,713	26.3	45.7
New Hampshire	74,004	20.5	62.5
North Dakota	72,082	13.9	2.5
New Mexico	65,417	14.1	50.6
Nevada	28,444	17.3	86.8
Rhode Island	17,458	3.5	2.6
Delaware	7,015	2.1	16.3

Source: Statistics on Outdoor Recreation, Marion Clawson
(Resources for the Future, Inc), pp. 99-101.

total numbers (not percentages), a limited demand even at best.

Table 14. This table pursues the same problem as the last but with respect to hunting. Note that the percentage of non-residents to residents drops off very swiftly except in isolated instances.

Indicator: Per Capita Wealth

Table 15. The table of per capita personal income approaches the increasing wealth of industrial society from the point of view of the impact of buying power on resource

Table 14. Rank order by states of absolute number of residents (15 years and older) buying hunting licenses, together with percent of resident population (15 years and older) buying hunting licenses and non-resident hunting licenses sold, as percent of resident.

States	Absolute # (1956)	% of resident (1950)	% of non-resident to resident (1955)
Michigan	1,198,374	21.6	1.76
New York	949,626	6.4	2.64
Pennsylvania	899,545	10.1	3.55
Ohio	681,086	12.3	.41
Indiana	677,357	3.4	.47
California	630,847	6.1	.18
Wisconsin	601,480	17.9	.83
Illinois	523,809	3.4	1.09
Minnesota	523,069	21.7	.42
Tennessee	459,668	14.4	1.04
Texas	396,724	5.9	.68
Virginia	384,614	12.3	1.76
Iowa	370,035	17.3	.93
Missouri	359,483	11.0	.57
North Carolina	340,019	10.0	1.57
Washington	305,321	23.5	.24
Oregon	274,572	17.8	.54
West Virginia	267,617	19.0	.28
Alabama	264,653	11.9	1.08
Kentucky	262,110	11.1	3.20
Colorado	261,954	34.0	6.24
Louisiana	244,025	12.5	1.15
Arkansas	225,644	21.6	3.47
Montana	192,443	36.4	.99
Kansas	189,858	13.4	1.18
Oklahoma	181,993	13.1	1.09
Georgia	181,059	4.8	.39
Mississippi	178,371	12.8	1.19
New Jersey	165,381	3.4	1.47
Nebraska	164,795	19.1	1.75
South Carolina	149,911	9.2	2.61
South Dakota	148,158	31.8	12.26

Table 14. Continued.

States	Absolute # (1956)	% of resident (1950)	% of non-resident to resident (1955)
Maine	146,155	20.2	17.67
Maryland	142,778	5.5	3.31
Idaho	137,463	39.0	2.77
Utah	130,350	25.7	8.30
Florida	125,764	4.6	1.73
Massachusetts	116,484	3.3	1.75
North Dakota	103,616	16.2	2.07
Wyoming	99,305	33.5	32.20
Arizona	98,607	11.3	3.48
New Mexico	78,836	12.3	3.65
Vermont	73,618	23.7	15.20
New Hampshire	66,492	20.5	29.15
Connecticut	54,439	3.1	1.20
Nevada	31,670	17.6	14.85
Delaware	18,700	7.5	2.04
Rhode Island	12,820	1.8	1.46

Source: Statistics on Outdoor Recreation, Marion Clawson
(Resources for the Future, Inc.), pp. 99-101.

Table 15. Per capita personal income, by states, 1960, in rank order.

States	
Delaware	\$ 3,013.
Connecticut	2,863.
Nevada	2,844.
New York	2,789.
California	2,741.
New Jersey	2,665.
Illinois	2,613.
Massachusetts	2,519.
Maryland	2,394.
Ohio	2,339.
Wyoming	2,334.
Michigan	2,322.
Colorado	2,320.
Washington	2,317.
Pennsylvania	2,266.
Oregon	2,259.
Rhode Island	2,228.
Missouri	2,199.
Indiana	2,179.
Wisconsin	2,171.
Nebraska	2,113.
New Hampshire	2,074.
Kansas	2,068.
Minnesota	2,054.
Montana	2,018.
Arizona	2,011.
Iowa	2,003.
Florida	1,988.
Texas	1,924.
Utah	1,910.
Maine	1,900.
Vermont	1,859.

Table 15. Continued.

States	
Virginia	\$ 1,848.
Oklahoma	1,848.
South Dakota	1,842.
New Mexico	1,806.
Idaho	1,796.
North Dakota	1,741.
West Virginia	1,674.
Georgia	1,608.
Louisiana	1,604.
North Carolina	1,574.
Tennessee	1,545.
Kentucky	1,543.
Alabama	1,462.
South Carolina	1,397.
Arkansas	1,341.
Mississippi	1,173.

Source: 1962 World Almanac, Harry Hansen (ed.), New York World Telegram (compiled from United States Department of Commerce, Office of Business Economics, 1962), p. 744.

use. In general it may be pointed out that the United States, the most highly industrialized and the most wealthy nation on earth, produced (1950) an astounding 40% of the world's goods and services with only 7% of the world's land area, and but 6% of the world's population. On the other hand "in 1950, for every man, woman, and child of the population, we consumed an average of 7 tons of fuel and more than 11 tons of other materials exclusive of vast quantities of water and air, which are important raw materials in many industrial

processes."⁴ And of the wealth generated in such a system "about 3% of consumption expenditure went for recreational goods and services in 1909 and in 1914 while the 10.2 billion spent in 1950 represented 5.2 percent of the total."⁵

The rank order of per capita personal income is something of a measure of this potentiality today. Again the states assume what is, by now, a fairly characteristic pattern (with the exception of Wyoming and Nevada with their huge ranches, oil, and gambling).

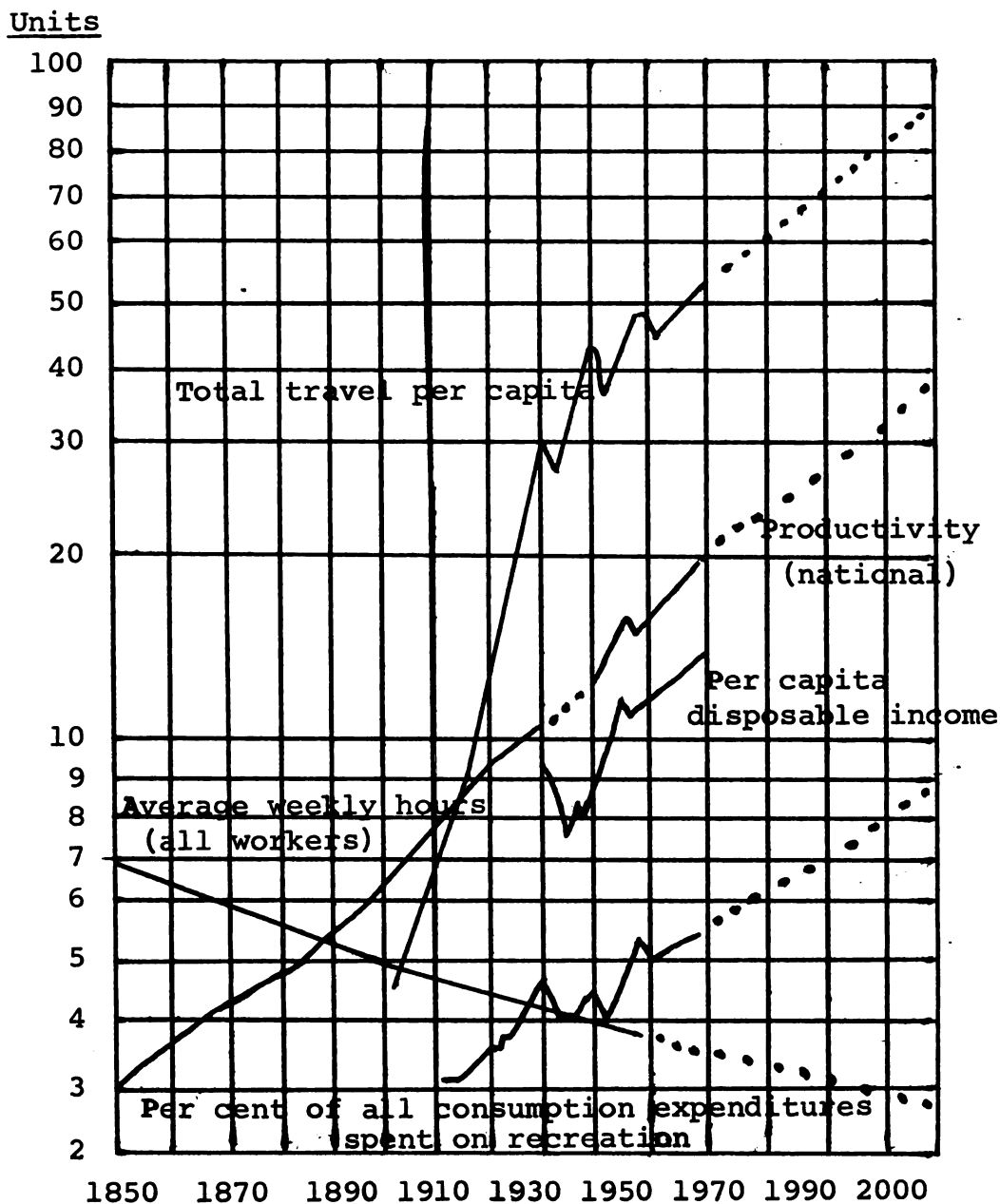
Figure 1. This figure explores, in graphic form, the interrelations of income, travel, and leisure as they have an impact on outdoor recreation in the past, present, and future. It draws together a variety of factors already discussed.

Returning now to Table 2 it should be noted that this table simply summarizes the findings from the thirteen rank orders. That is, by dividing the thirteen rank orders into equal thirds the number of interpretations falling within each third (high, middle, or low) is established and the data summarized in convenient form. There could, of

⁴J. Frederic Dewhurst and Associates, America's Needs and Resources (The Twentieth Century Fund, Inc., 1955), p. 939.

⁵Ibid., p. 930.

Figure 1. Income, travel, and leisure factors affecting the use of outdoor recreation facilities for period 1850-2000.



Source: Land for the Future, Marion Clawson, Burnell Held, Charles H. Stoddard (The John Hopkins Press, 1960), adapted after Figure 19, p. 130.

course, have been additional sub-indicators, perhaps there could also have been less. At any rate any state in which ten or more interpretations "cluster" seems to fall within a safe margin of error for comparative examination.

Data on the Wild Land Variable

The necessity of controlling the amount of wild land in each state rests on the fact that a state (no matter how industrialized) which has nothing but urban area, roads, and cropland is hardly in a comparable position with a state of similar industrialization but with great stretches of forest, wetlands, and open country. Furthermore, this factor impinges upon nearly every aspect of the industrialization of society (with reference to resource control), and it does so not generally, but specifically for all the interpretations I have presented. Therefore, the need to arrive at some reasonably accurate estimate of the wild land in each state, land which can call forth conservation efforts, is at once apparent.

At the outset, however, I intend to exclude all forms of agricultural conservation as outlined in the empirical design. This leaves a very wide assortment of lands to locate in each of the several states. Table 16 summarizes these findings for each state and comprises the

central feature of control exercised in this study. Please note at the outset that California, Texas, Delaware, and Rhode Island have been excluded because they fell in no sequence sufficiently similar to other states to make comparison possible.

The computing of the wild lands (Table 16) proceeds essentially by subtracting the non-wild lands of the state from the total figure of state acreage and then adjusting the remainder.

Excluded from each state total are the following land uses: cropland, pasture, and grazing (except in forests), urban areas, rural highways, rural railroads, rural airports, farmsteads, farm roads and lanes, national defense holdings, A.E.C. lands, national guard camps, rural rifle ranges, rural golf courses, fairgrounds, rural radio stations, flood control areas, watershed protection areas, Indian reservations, and holdings of Bureaus of Land Management and Reclamation.

In addition it excludes 1,520,000 acres of the Cabeza Prieta and Kofa game areas in Arizona and 2,728,711 acres of the Desert Game and Charles Seldon areas of Nevada, which are reported in government statistics as grazing areas. It also excludes 520,000 acres in Iowa listed as forest

Table 16. Absolute acreage in "wild lands" by states, circa 1954-59, as control factor.

State	
California	66,034,976
Texas	43,525,522
Oregon	31,236,385
Washington	28,134,076
Florida	25,154,487
Georgia	25,001,766
Arizona	24,770,026
Montana	24,708,066
Minnesota	24,392,591
New Mexico	23,891,947
Idaho	23,470,136
Michigan	23,093,353
Colorado	21,958,778
North Carolina	21,390,060
Arkansas	21,348,102
Alabama	21,267,654
Utah	20,967,200
New York	20,261,199
Nevada	20,071,602
Louisiana	19,625,218
Maine	18,013,634
Mississippi	17,822,836
Wisconsin	17,822,106
Missouri	17,700,775
Pennsylvania	17,679,116
Virginia	16,915,073
Tennessee	14,719,685
Wyoming	13,911,701
South Carolina	12,676,972
Kentucky	12,152,051
Oklahoma	11,498,673
West Virginia	10,852,711
Ohio	7,764,069
Illinois	7,101,722
Indiana	6,425,723
New Hampshire	5,128,034
Vermont	3,989,055
Massachusetts	3,558,156

Table 16. Continued.

States	
Iowa	3,338,919
Maryland	3,302,855
South Dakota	2,996,951
New Jersey	2,620,801
Kansas	2,609,491
North Dakota	2,165,767
Connecticut	2,144,217
Nebraska	2,041,664
Delaware	627,745
Rhode Island	466,426

Source: See text for detailed breakdown of computation.

lands but not requiring fire protection and 379,000 acres in Ohio of the same class, both of which are marginal lands, and neither of which materially alter the figures for the states.

The figures cited for each state include the following: state forests, state recreation areas, state parks, state wildlife refuges, roadside parks, state game areas, state fishing sites, together with national forests, national recreation areas, national parks, national wildlife refuges, national monuments (if wild), national memorial parks (if wild), national parkways, national seashore recreation areas, plus all commercial and non-commercial private forest holdings (whether grazing is allowed in such or not), and the following land forms: marshes, swamps

(if not in wildlife refuges), sand dunes, bare rock areas, sheer mountain, and deserts.

In addition the inclusive figures contain acreage on the Adirondack and Catskill parks of New York and includes acreage for the 292 wildlife refuges of the nation. It does, however, exclude, in addition to that mentioned above, all bodies of water beyond 40 acres in extent, and it excludes unlisted minor miscellaneous holdings.

It should be noted that because of the complexity of computing this table the figures are only approximate. This is partly the result of the number of classes of land use involved, but it is also a direct result of the following circumstances: differing definitions of land classes; the fact that the figures are drawn from sources whose dates of compilation vary; and the important factor that certain classes of land are transitional in type. Nonetheless the figures must be only approximate for our purpose and I do not believe that these matters greatly, if at all, affect the present consideration.

Chief sources for the figures were the following:

Timber Resources for America's Future, Forest Service, United States Department of Agriculture, Forest Resource Report 14, January, 1958, Table 16, p. 534.

Areas Administered by the National Park Service, United States Government Printing Office, Washington, D. C., January, 1961.

Statistical Abstract of the United States, 1961,
United States Department of Commerce, Table 254,
p. 194 (1959).

Major Uses of Land in the United States, Summary
1954, H. H. Wooten and James R. Anderson,
Information Bulletin 168, United States Department
of Agriculture, January, 1957, Table 22, pp. 59-60,
and Table 30, pp. 75-79.

The fact that I have included, in this table of "control," wild lands that are in federal ownership may arouse some questions. It may, for instance, be argued that in a state in which there are large federal holdings (forests or parks, etc.) the need for conservation efforts on the part of the state--efforts supposedly flowing out of the rationalization of industrial organization--is obviated. In other words, it may be argued that in such states there are already available sufficient parks, campgrounds, fishing sites, and general public lands to meet state needs. If this were true, control of state and federal lands would have to be undertaken individually. Another argument, along similar lines, might maintain that insofar as the federal government aids states in their conservation efforts, that by so doing they also stimulate conservation activity.

Taking this last argument first, we may note that if it is true it will bias the study against the hypothesis in question. After discussing the matter with conservation officials I am ready to chance the bias as it stands. My

feeling is--in concert with others--that the funds involved will have very little if any major consequences. It may impart a certain skew to the middle ranges of the industrial ranks, but for the extremes it is clearly an inadequate factor. Nonetheless, for the middle ranges states shall be, insofar as possible, selected either exclusively from the eastern United States or the western United States or both, but not mixed. Since federal lands in the east are rudimentary the bias should be overcome.

The second argument, concerning the role of federal funds and personnel, in satisfying conservation needs where federal state holdings are large, must be answered in more detail.

First, the issue centers not around the quantity of land held in state or federal tracts--at least not exclusively--but around intensity of use and the pressure on the land. Much land in state holdings (as in the case of Wyoming, see Table 1) with low use or pressure means little conservation activity, i.e., few personnel, low expenditures, little research, low bureaucratization, etc.--even where land holdings are extensive. On the other hand New Jersey (see Table 1), with as much land as Wisconsin (ibid.) in state parks, spends nearly four times as much money on them (i.e., on personnel, equipment, etc.) as does a state seven

and one-half times as large but which among other factors, contains only a little more than half the population of the former. The same may be said of Massachusetts with only slightly less population and with more land area.

Second, the entire question of the adequacy of federal conservation measures for industrial states, regardless of intensity of use, can itself be easily questioned. The federal government designs its programs for the nation and not the states alone. The result is that federal holdings are in connected blocks often situated at great distances from urban centers and population concentrations. This is especially true of wilderness areas, national parks, wildlife refuges, and even of national forests. Thus the needs of the state are placed below the needs of the nation, except where compatible. Furthermore, no matter how great the land holdings may be, there is still plenty left over for state use. And, except in certain reserved areas, the government has not fought the states on the matter of adequate land holdings for the resident population. One has only to observe a few figures to realize that regardless of federal holdings, the states needs must still be met under the impact of industrial factors. Wyoming, as we have noted, has large state park holdings (apparently for reasons of sentiment) and is not industrialized (though per capita

income is high). On the other hand while Wyoming's federal lands constitute 47.8 percent of total state land, California, with its great industrialization, has a nearly identical federal land holding program (47.0), yet its state park system is second only to New York. It spends more money on its parks than any other state, and registers the second highest visitor mark in the country (677,007 acres, \$21,757,000 annually, and 22,196,000, respectively). Washington, also quite industrialized, shows no state diminuation of conservation activities in spite of large federal land holdings (29.9). In fact it ranks--on the state park indicator (ibid) well within the top third, being twelfth in the nation. Apparently, if a state is industrialized, the pressure on the land is great enough to override other factors, especially when the federal lands themselves are at far removes from the industrial society centers.

Finally, as our first argument suggested, since there are cooperative efforts between federal and state structures, the possibility of finally distinguishing the federal and the state lands appears futile. Not only in soil and farm conservation--which we are not considering in this study--but in hunting (Pittman-Robinson Act), fishing (Dingel-Johnson), forest fire protection (Clark-McNary), and research (McNary-McSweeney) and other projects, both groups work in

concert. And while such stimulus to the various states--with large federal holdings--may not eclipse the impact of high industrialization or its absence, it would bias the project just as much to separate state and federal wild lands, as to ignore them at all levels of industrialization when left in--a factor we have taken into consideration above.

Data on Institutionalization of Rational Resource Control

I have presented the summary data on state parks, the data on degrees of industrialization within the several states, and the data concerned with amounts of wild land; it is now time to draw together the data constituting the other variable of the dissertation's correlation, mainly research concerned with degrees of institutionalization of rational resource control.

In selecting the states to be surveyed by use of a conservation questionnaire, both the industrial rankings and the control factor had to be kept in mind. Alaska and Hawaii, as noted earlier, were eliminated because of the recency of their statehood. Five other states were eliminated because of random variation with respect to the sub-indicators of industrialization. Three additional states were eliminated by virtue of the fact that the quantities of wild land which

they contained bore no relation comparable to any of the other states in the wild land table. Thus at the outset ten states have been removed from consideration. These states are: Alaska, Hawaii, Virginia, Maryland, Rhode Island, North Carolina, Delaware, Nebraska, Texas, and California.

Of the remaining forty states further elimination was necessary on grounds of the wild land control alone. It is clear that only those states possessing within their boundaries reasonably similar quantities of wild land can be scientifically compared. Furthermore, it is clear that if the comparison is to assume something of the nature of a continuum, ranging from maximum to minimum industrialization, then states must be selected both for their exhibition of the range of industrialization and for the fact that they are relatively contiguous on the wild land table. Two such continua do in fact occur with the correct properties. If the reader will turn again to the wild land table (Table 16) he will note that continuum series number one commences with acreage 23,470,136 (the state of Idaho) and ends with acreage 17,679,116 (the state of Pennsylvania). Within this spread there occur some fifteen states several of which fall into each of the three divisions of the industrial society rankings. From these fifteen states, twelve were selected for questionnaire survey.

The second continuum commences with acreage 17,822,836 (the state of Mississippi--and thus is overlapping with the first continuum) and ends with acreage 11,498,673 (the state of Oklahoma). Within this spread there occur some ten states several of which again fall into each of the three divisions of the industrial society ranking (excepting the "least industrialized" third which contains only one state, mainly Mississippi). From these ten states seven were selected for questionnaire survey.

One other technique of selection was utilized. Granting that a continuum of states is most desirable, extreme positions can also be instructive. Therefore, three pairs of states falling at extreme ends of the industrial rankings, but with comparable quantities of wild land, were surveyed in addition to the two continua above. These were respectively: New Jersey-North Dakota, Massachusetts-Vermont, Indiana-New Hampshire.

The total of all states surveyed comprised twenty-two states. Seventy-one organizations involved with public conservation measures were contacted by means of a letter containing four items: a four-page questionnaire which included instructions and clarification in the form of notes attached. The questionnaire contained seven basic questions

with sub-totals and breakdowns. Second, a cover letter was included with the name of the organization, the individual responsible for information services, and a general description of the project. It also included assurances that the information would aid conservationists and that it could be kept confidential if necessary. Third, a second (smaller) cover letter was included, written by Dr. Justin W. Leonard, Research Director, Michigan State Department of Conservation, Lansing, Michigan. Fourth, a self-addressed stamped envelope was enclosed.

Of the seventy-one questionnaires, sixty-three (88%) were eventually returned. Of these, seventeen states of the original twenty-two were in sufficient condition to be utilized in the survey. One anticipated set of paired states (Michigan-Minnesota) had to be abandoned, due to incomplete data, and (in addition to Minnesota) Missouri, Oklahoma, Colorado, and Arkansas also proved dumb or insufficient. Of the sixty-three questionnaires returned, fifty-five involved the seventeen surveyed states (71%) of the dissertation. A list of the original twenty-two states with their seventy-one public conservation organizations may be found in the Appendix (page 240). Since several of the states requested that the information be kept confidential

no breakdown of the specific organizational sub-totals is attempted.⁶

Three summary tables (Tables 17, 18, and 19) present the data as compiled from the several questionnaires of each state. Table 17 and Table 18 represent the data on the two continua (mentioned above), while Table 19 presents the data on the paired extreme states.

Before reviewing the content of the conservation tables a note is necessary on the private features of conservation. The National Wildlife Federation in their "State Affiliate Fact Sheet Summary"⁷ notes that private conservation clubs and organizations exist in bewildering profusion and unevenness throughout the United States (one in Washington, D.C.; 1,300 in New York). It was, therefore, patently impossible to survey such a range of organizations to assess the features I have outlined for public conservation activities. Instead, at the end of each of the state

⁶ Names of states and their respective organizations sub-totals will be supplied, upon proper request and identification, by the author. The necessity of this disguise results from the fact that a small number of surveyed states have either one or a very reduced number of public conservation organizations. The result is that the name of the organizations is sufficient to divulge the source of the information.

⁷ The National Wildlife Federation, State Affiliate Fact Sheet (Washington, D.C., 1962).

summaries, in the aforementioned tables, gross membership figures for each state's private conservation organizations is presented for what it is worth. Certainly it tells us something, especially something political since numbers count in politics. But undoubtedly organization of that membership counts even more heavily and can offset (easily) the inert membership of a group many times as large. Nonetheless, the figures are instructive and they are offered as some indication of the private sector within a surveyed state.

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In the first chapter of Science and the Modern World, Alfred North Whitehead noted that the peculiarity of modern science, in its origins and in its present state, is its confrontation of "general ideas" with what he tellingly designated as "irreducible and stubborn facts." Certainly the Greeks had plenty of general ideas, and certainly the Egyptians had worked with irreducible and stubborn facts. But the singular flavor of modern thought, Whitehead contended, was the happy conjunction of the two orders of events. I am now prepared to subject a set of general ideas, in the form of the hypothesis and its correlates, to the irreducible and stubborn facts which have been gathered.

Tables 17, 18, and 19, in the form of three continua, summarize these facts. As I noted earlier a total of

Table 17. Continuum No. 1. Summary table of institutionalization of rational resource control sub-indicators of nine states ranked by degree of industrialization.

	State	Total State Budget	Average Research Budget	Total Employees	Employee Tenure (% Salaried)
Highly Industrialized	NEW YORK (20,261,119)	29,029,922.	328,650.	6,416	.49
	PENNSYLVANIA (17,679,116)	18,061,990.	337,651.	3,657	.31
	MICHIGAN (23,093,353)	15,859,793.	404,700.	1,877	.91
	WISCONSIN (17,822,106)	12,932,561.	523,086.	3,636	.64
	LOUISIANA (19,625,218)	7,223,980.	360,000.	1,518	.94
Moderately Industrial- ized	ALABAMA (21,267,654)	3,794,952.	210,042.	1,027	.70

Least Industrialized	IDAHO (23,470,136	2,655,157.	241,000.	459	.55
	MAINE (18,013,634)	2,191,315.	158,170	742	.54
	MISSISSIPPI (17,822,836)	3,529,955.	80,000.	755*	.66*

*Estimated on basis of partially incomplete questionnaire.

Source: Primary data collected by survey research questionnaire of state public conservation organizations; secondary data on private conservation organizations collected by the National Wildlife Federation, "State Affiliate Fact Sheet Summary," Washington, D. C., 1962.

Table 17. Continued.

	Total Degrees Held	Degrees Held Breakdown			Number of Employees Per Degree Held	Number of Employees Per <u>One</u> Clerical Worker	All Organi- zations 10 Years or Older Public Legality Estab.	Total Membership In Private Conservation Organizations
		Degrees Held Breakdown						
		B.A.- B.S.	M.A.- M.S.	Ph.D. (science)				
N.Y.	915*	868*	36	11	7.0*	21.5	YES	300,000
PA.	405	325	65	15	8.1	12.8	YES	129,710
MICH.	520	407	100	13	3.6	7.5	YES	60,000
WIS.	417	343	64	10	8.7	26.9	YES	60,000
LA.	112	79	27	6	13.5	14.1	YES	9,901
ALA.	105	62	39	0	9.7	12.5	YES	UNKNOWN

ID.	93	72	19	2	4.9	9.7	YES	20,000
MA.	145	113	29	3	5.1	13.7	YES	3,700
MISS.	115	102	13	0	6.5*	17.4*	YES	4,360

*Estimated on basis of partially incomplete questionnaire.

Table 18. Continuum No. 2. Summary table of institutionalization of rational resource control sub-indicators of five states ranked by degree of industrialization

	State	Total State Budget	Average Research Budget	Total Employees	Employee Tenure (% Salaried)
Highly Industrialized	PENNSYLVANIA (17,679,116)	18,061,990.	337,651.	3,657	.31
	WISCONSIN (17,822,106)	12,932,961.	523,086.	3,636	.64
Moderately Industrialized	KENTUCKY (12,152,051)	3,780,811.	101,500.	1,148	.45
	TENNESSEE (14,719,685)	3,868,215.*	136,711.*	891*	.36*

Least Industrialized	MISSISSIPPI (17,822,836)	3,529,995.	80,000	755*	.66*
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*Estimated on basis of partially incomplete questionnaire.

Source: Primary data collected by survey research questionnaire of state public conservation organizations; secondary data on private conservation organizations collected by the National Wildlife Federation, "State Affiliate Fact Sheet Summary" Washington, D.C., 1962.

Table 18. Continued.

	Total Degrees Held	Degrees Held Breakdown			Number of Employees Per Degree Held	Number of Employees Per <u>One</u> Clerical Worker	All Organi- zations 10 Years or Older Public Legality Estab.	Total Membership In Private Conservation Organizations
		Degrees Held Breakdown						
		B.A.- B.S.	M.A.- M.S.	Ph.D. (science)				
PA.	405	325	65	15	8.1	12.8	YES	129,710
WIS.	417	343	64	10	8.7	26.9	YES	60,000
KY.	118	100	18	0	8.7	12.8	YES	37,554
TENN.	77*	68*	8	1	11.5	18.5*	YES	40,000

MISS.	115	102	13	0	6.5*	17.4*	YES	4,360
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*Estimated on basis of partially incomplete questionnaire.

Table 19. Continuum No. 3. Polar extreme summary table of institutionalization of rational resource control sub-indicators of six states, occurring as three pairs occupying extreme positions with respect to degrees of industrialization. Matched numbers identify pairs.

		Total State Budget	Average Research Budget	Total Employees	Employee Tenure (% Salaried)
Highly Industrialized	#1 INDIANA (6,425,723)	4,454,833.	343,971.	1,170	.36
	#2 NEW JERSEY (2,620,801)	3,890,000.*	198,000.*	998*	.75*
	#3 MASSACHUSETTS (3,558,156)	4,910,000.	279,000.	1,187	.79
Moderately Industrialized					

Least Industrialized	#1 NEW HAMPSHIRE (5,128,034)	587,432.	55,500.	48	.57
	#2 NORTH DAKOTA (2,165,767)	694,672.	9,725.	112	.34
	#3 VERMONT (3,989,055)	1,842,627.	32,000	541	.26

Source: Primary data collected by survey research questionnaire of state public conservation organizations; secondary data on private conservation organizations collected by the National Wildlife Federation, "State Affiliate Fact Sheet Summary," Washington, D.C., 1962.

Table 19. Continued.

	Total Degrees Held	Degrees Held Breakdown			Number of Employees Per Degree Held	Number of Employees Per One Clerical Worker	All Organi- zations 10 Years or Older Public Legality Estab.	Total Membership In Private Conservation Organizations
		B.A.- M.A.-						
		Ph.D.						
		B.S.	M.S.	(science)				
#1 IND.	190	135	45	10	6.1	13.6	YES	12,000
#2 N.J.	198 *	139 *	52 *	7 *	5.0 *	6.7 *	YES	30,793*
#3 MASS.	179	131	43	5	6.6	9.7	YES	UNKNOWN (excess of N.J.)

seventeen different states are involved, with three of them (Pennsylvania, Wisconsin, and Mississippi) serving on two different continua. Thus, in the three tables a total of twenty units are compared.

The data are broken down into twelve columns in each table, and are tabulated such that the highly industrialized states appear at the top of the table, the moderately industrialized states (except in Table 19) in the middle, and the least industrialized states at the bottom. The titles given to each of the twelve columns are meant to reflect the sub-indicators of the major variable as developed above in the conceptual discussion of resource control. In some few instances an asterisk (*) accompanies a particular bit of data. This indicates that a questionnaire was incomplete and an estimate had to be made. All estimates are based upon evidence and are (when necessary) biased against the expectation. Thus in the case of Mississippi it is not clear from the questionnaire what the word "seasonal" means (three months or six) in the context of a question on employee status and size. The larger figure was employed-- a fact which, because Mississippi falls in the "least industrialized" segment of the states, biases the data against the hypothesis.

Proceeding from the affirmative sub-indicators of the hypothesis to the questionable and perhaps disconfirming, we may begin with Table 17 and the first column designated "total state budget." In this table nine states are being compared with one another with respect, in this instance, to the summary total expenditures of all state conservation activities (excluding of course soil and agricultural conservation as noted above). Four of these states fall into the highly industrialized bracket, two into the moderately industrialized bracket, and three into the least industrialized bracket. In terms of wild land control the extremes vary by 5,548,030 acres, while individual members differ by as little as 726 acres. There results a fairly compact continuum which makes comparison meaningful. The total state budgets for the nine states run from \$29,029,922 to \$2,191,315 for New York and Maine respectively. Without question the figures of this sub-indicator of control affirm a general correlation between industrialization and expenditures on resource matters. Of the nine states Mississippi represents the only deviation from the general pattern, and as a deviation it is not great. It must be added that when other data on Mississippi are reviewed (same table) the general correlation holds.

One might speculate as to why this deviation should occur at all in Mississippi. A possible explanation lies in extreme poverty and rural situation coupled with its vast reserve of hardwood forests. These hardwoods constitute the chief, perhaps the only, important source of state gain. Unlike Idaho, with its huge conifer concentrations, hardwoods are in real demand, and the state that has them has something like a monopoly. Being to some extent a one industry state it is not surprising to find a liberal forestry budget (amounting to nearly \$2,000,000), which over-shadows the other conservation activities such as fish and game. Idaho on the other hand could spend a similar amount but with little return to the state's economy. Especially is this so in recent times with the influx of Canadian softwoods, the ten percent devaluation of the Canadian dollar, and the great access and transportation advantages conferred on Pacific Ocean ports. An additional factor enters into a consideration of the state budget figures of Mississippi. When we compare it to Maine we note that there is well over a million dollar differential. The northern states have always prided themselves on their conservation mindedness while the south has left it to the federal government to enforce conservation (TVA). But with nearly the same quantities of wild land Maine and Mississippi refute this

contention. Again I believe the difference reflects the market importance of hardwoods (Maine being a pine state). Also, the reason for Idaho's relatively low placing (Idaho has over 5,000,000 more acres), when compared to Maine, undoubtedly reflects the impact of federal programs which relieve state pressure--the eastern states being less favored in this respect. But even granting the impact of such outside influences as lumber markets and federal agencies on a state's conservation picture, the discrepancy is not great. More remarkable by far is the massive consistency with which the correlation I have posited occurs. Given nine states with closely similar amounts of wild land the impact of industrialization is obvious.

If we turn next to the respective research budgets the same conclusions appear. Taking an average (over the three most recent years) of sums spent on research by all state conservation organizations, the industrial states have a clear lead over the non-industrial states. A differential of \$448,086 separates the top from the bottom, with a range from \$523,068 to \$80,000. The unusually large research expenditures of Wisconsin and Michigan undoubtedly reflect basic differences in professionalization of the structures as compared with Pennsylvania and New York, a fact which is acknowledged in conservation circles but

which does not alter the overall pattern. Just as size of total budget is a sub-indicator of degree of control, so size of research expenditures is a sub-indicator of rationality--in the form of the application of empirical science in the means-ends nexus.

Turning next (column three) to total number of employees involved in state resource organizations, we again note the same correlation by industrial states. Since number of people involved in conservation is some (admittedly crude) measure of control these figures serve (together with total budgets) as our third sub-indicator. The range of personnel size extends from 6,416 in New York to 459 in Idaho, with a differential between the two of 5,957. Michigan and Idaho break the drift of the correlation to a slight extent, enough to raise questions. Michigan formerly had a considerably larger body of personnel involved in conservation. Recent cuts due to fiscal incapacity and failure to respond on the part of government have called for severe cut-backs. Much of this has meant a cut in field staffs and in the police arm where large numbers were supported on modest budgets. The cut-back (in the form of refusal to replace retired or otherwise resigning personnel) has meant a large drop in numbers relative to costs. Idaho, on the other hand, is a sparsely populated state surrounded

by sparsely populated regions and its deviation from the norm reflects this fact. Both Maine and Mississippi either are close to large population areas or themselves have--relative to Idaho--dense populations. Much recreation conservation involves large personnel outlays and this is highly associated with population concentrations (see Table 1). There is also the fact of large federal holdings in national forests in Idaho, which reduces the figure somewhat relative to the east. Nonetheless none of the deviations are striking and the general correlation is upheld. It should also be noted that the situation of Louisiana, which is high on most indicators, results from the fact that it is at the very top of the middle ranges of industrialization; its data nicely reflect this fact.

If we next examine columns four and eleven entitled "employee tenure (% salaried)" and "all organizations 10 years or older; public legality established" respectively, we can summarize the results of these sub-indicators of institutionalization. The concept of institutionalization is implied in both the sense of "a regular and established way of doing things" and in the sense of "an association which serves public rather than merely private interests, and does so in an accepted, orderly, and enduring way."

Columns four and eleven again support our contention with regard to both instances. Needless to say it would have been most surprising, in the United States, not to find such a correlation in a survey of public resource institutions, but it needed confirming nonetheless. All the states in Table 17 have a sufficiently tenured staff to justify them as involving institutionalization in the first sense given above. It is true that Pennsylvania is remiss in this matter because of the peculiar nature of its decentralization of conservation activities, but even a one-third salaried staff is impressive from the point of being "regular and established." And in Louisiana after the neopotism of the Long governments it is not surprising to find the populist reform producing a sweeping salaried civil service accounting for a .94 salaried personnel.

But not only are all the staffs of sufficient permanence in all states to amount to institutionalization, the duration of all the organizations in all the states extends to at least ten years, and more generally to several decades. Finally, institutionalization in the sense of "serving public rather than merely private interests" is verified for all organizations in all states by virtue of its legality in public codes, statutes, and laws. No exception exists.

Turning next to column twelve, in Table 17, and the

scant but informative data on "total membership in private conservation organizations," we learn again that the correlation with industrialization is nearly perfect. These figures, which range from 300,000 in New York State to 3,700 in Maine, are the total membership in all known private conservation organizations for the states. Since we are dealing with similar amounts of wild land in the several states such figures amount to real evidence for our hypothesis. Alabama's total was not given by the National Wildlife Federation, but the other eight states fit the general picture nicely. As in most instances in this dissertation the data on conservation is given in absolute terms. Impact and control are what we are interested in--or indicators of them--and not some relative figure. Given a fixed quantity of wild land absolute figures alone can tell the story.

We may now review orders of data that are ambiguous or questionable and others that, if not disconfirming, are then either mistaken or irrelevant. The first deals with the number, type, and ratio of degrees held in higher education by personnel involved in the totality of state public conservation organizations. The second deals with the ratio of clerical employees to non-clerical employees in the sum total of all state public conservation organizations.

Both of these pieces of data are concerned with the rationality of organization. The first is concerned with rationality in the sense of application of science--we have seen part of the data on this in our review of research funds. The second is concerned with rationality in the sense of bureaucratic rationality as outlined in the empirical design.

Examining the fifth through the eighth columns of Table 17, it can readily be seen that in terms of sheer numbers of degrees, the industrial correlation with conservation still holds. The range is from 915 in New York to 93 in Idaho. It is not as neat a correlation as the former, with the chief ambiguity appearing toward the least industrial end of the continuum, but it is apparent that a correlation exists. Idaho again probably suffers from its large federal holdings which tends to skew its representation.

If we think of higher degrees in the sense of indicating expertise, (felt to be common features of bureaucracy) then there is no question that the industrial states surpass the non-industrial states. Everyone since Weber has argued for certification and similar objective criteria as one mechanism for establishing the presence of bureaucratic forms. It is also evidence of the operation of "universalistic" selection criteria, another indicator of bureaucracy. In this sense we have two separate but related sub-indicators

such as we are seeking: evidence of rationality as expertise in use of science, and evidence of rationality in certification and universalistic selection techniques. The only question is, do we want this to be stated relatively or absolutely.

Before offering the arguments on both sides let us examine columns six, seven, and eight to see what the composition of these degrees amounts to. As might be expected the largest concentration of degrees beyond undergraduate school are found in the heavy research states (Wisconsin, Michigan, etc.), yet while there can be no question that industrialization produces an impact, a considerable representation is found in the middle ranges (Louisiana: 27 M.A.-M.S., 6 Ph.D.'s in science). The number and sophistication of the degrees tapers off as the least industrial states are approached.

The real question is: which is most important, the absolute number of degrees or the relative? I believe this question is ambiguous. If we are interested in degree of expertise, that is in the extent to which empirical science is applied and general learning available, then clearly only the absolute figures are important. This is so precisely because we are working with a fixed amount of wild land, and any increase in the knowledgeability of the personnel involved must--if we accept the sub-indicator--reflect an

increase in rationality. Of course we could deny that degrees are any measure of this, but that seems extreme except to poets and romantics. Thus the size of the organization, relative to its number of degree holders, is of no importance. This argument is reinforced as we realize that the more degrees a conservation worker has, the higher will be his position within the organization. There may, of course, be exceptions but they must be very few indeed. This means in effect that direction and policy are frequently established (or at least administered) by such an educated elite. Thus absolute size alone is important when we consider rationality in the sense of use of science and general knowledge for the neatest fit of means to ends.

But when we turn to rationality in the sense of "certification" and the application of "universalistic standards" the argument will not hold. In this sense of rationality, i.e., as criterion of bureaucratization, only the relative number of degrees is important. And since the absolute data of columns five, six, seven, and eight cannot help us in this matter, we must turn to column nine where ratios have been worked out. Column nine entitled "number of employees per degree held" shows quite clearly that there is no correlation between conservationist's degrees and the industrialization of society. Therefore, there is no

correlation--by this criterion--between bureaucratic rationality and industrialization. Louisiana turns out to have lowest ratio while Alabama falls close to Wisconsin. Furthermore, Idaho and Maine both outdistance New York. Before attempting to account for this phenomena--which incidently is an about face of some proportions--it is worthwhile considering the data in column ten.

Column ten entitled "number of employees per one clerical worker" appears to have little to do with what we have been discussing. It does, however, bear on the same point. We are considering indicators of rationality in the sense of bureaucratic rationality. Certification and universal selection criterion are indicators of such rationality, but--as was outlined in the discussion of the empirical design (above)--so is the ratio of clericals to non-clericals. Bureaucracy has as one important feature: the fact that task specialization exists without professionalization. The job of bureaucracy is to coordinate the great task diversity and specialization of the individuals involved for a concerted end. Bureaucracy is therefore an administrative structure. The argument is (see Stinchcombe, op. cit.) that files and records are more necessary where such task coordination must occur from above, rather than below as in a professionalized workforce (construction trades). What

then do the findings show? Is there a general relation between degree of industrialization of a state and the worker-clerical ratio of its conservation organization? The answer, on the basis of my data, is no. New York and Wisconsin turn out to rank below Idaho and Alabama, while only Michigan looks like what the hypothesis contends.

Reinhard Bendix in Work and Authority in Industry, has argued that the best single index of degree of bureaucratization is the ratio of salaried to non-salaried in the occupational structure of a country (op. cit., p. 211). If we were to apply this criterion to conservation organizations, even that index would fail, as can be easily seen from reviewing the data in column four (collected for other purposes), which compares the salaried to the non-salaried in all state conservation organizations as given in percentages.

We have then three columns of data (four, nine, and ten) all bearing on the same point and all coming to the same conclusion: that rationality by bureaucratization, whether measured by percent salaried to non-salaried, ratio of degrees, or ratio of clericals--that all such indicators deny there is a correlation between bureaucratic rationality and industrialization in public conservation organizations.

Contrary to all of the other findings of Table 17 this evidence bears against the hypothesis. What does it mean? It could mean, I believe, one of five possible things. First, it could be pure chance, a fantastic long shot. This, it seems to me, is not worth consideration, especially when Tables 18 and 19 are considered. Second, it could mean that offices have been automated in a number of the key deviants. The instructions given for this item on the questionnaire do not exclude that possibility.⁸ Again this does not have much appeal since it also rests on a long shot. Besides it is difficult to imagine a poor state getting the automation leap on a rich state in such a matter. It should be the other way around. Third, the question may have been ambiguous or the data very poor. Both are possibilities. Ambiguity seems somewhat unlikely not only because of the instructions but because of the reception it got in agencies where it was first worked out (Water Resources and Department of Conservation,

⁸They read as follows: "By 'clericals' is meant any state employee whose primary job (1/2 or more of total work time) is spent in keeping, creating, or ordering records, communications, and information. Thus, secretaries, stenographers, typists, filers, accountants, classifiers, record keepers, etc. qualify. Excluded should be scientists, technologists, researchers, managers, administrators, directors, supervisors, proprietors, commissioners, writers, and generally all professionals, even if they do occasionally keep records and do clerical work, but if that work does not average 1/2 or more of their total work time."

in Michigan). The possibility of bad data is not out of the question. Of all the items on the questionnaire this one required the most effort. In some situations that effort was greater than in others, since some personnel departments were well organized while others were not. At any rate the possibility is there; it took a lot of counting. Fourth, with respect to the data on percentages of the work force salaried and non-salaried in state organizations, the indicator of bureaucratic rationality may be meaningless. Bendix urged his single "best" index with respect to economic organizations. State government agencies, such as conservation, are not economic. The fact that they often manifest (Louisiana) a high percentage of salaried employees follows from the fact of government. Even when one grants the weakness of the civil service movement in the United States (Pennsylvania, for instance) the inroads have been sufficient to create large salaried blocks in all governmental agencies. Thus the index of salaries versus their lack is worthless in any study of the present type. Fifth, the anomaly which columns nine and ten present still persists even if that of column four has vanished. The problem, I believe, resides in the inadequacy of the original conception around which the indicators of educational degrees and clerical personnel were

designed. The fact that this conceptualization was inadequate does not mitigate the value that the original conception had, nor does it mean that all is lost. It helps to clarify conceptual thinking to make partial mistakes and I believe this is true in this case as well as in others.

We have noted that rationality exists (in an absolute sense), confirmed by the data on the several states in Table 17. This type of rationality has been referred to as expertise or professionalism and it relates to the use of empirical science and general knowledge in the solution of problems. The other kind of rationality (organizational rationality in the form of bureaucracy, pure and simple) we have not demonstrated. The reason for this, I would argue, is that it does not exist. The public state organizations which I have surveyed are not rational bureaucracies, nor on the other hand are they professional bureaucracies--they are a combination of both types. Unfortunately I know of no reasonable index (such as salaried, clericals, etc.) for ascertaining this phenomena. But, in part this has already been demonstrated by virtue of the increase (absolute) in professionalism (measured by degrees) in states having similar amounts of wild land. The manner and the structure of such organizations beyond this is not known. The range and types which such organizations may take must be enormous

and a major achievement would commence with a typology. Clearly in a structure in which researchers are frequent,⁹ and in which tasks are frequently regulative rather than instrumental the likelihood of files and records showing a relative increase diminishes. Furthermore when many of the personnel involved with regulative functions are themselves professionalized (game biologists, foresters, geologists), the problem of sorting out the two is doubly difficult. At any rate my data clearly do not respond to it, and in this sense the rationality of conservation organizations that I demonstrate must rest on scientific rationality coupled with a definite but oblique body of evidence on the role of professionalism--the latter evidence being data on degrees. Needless to say more research is advised, not so much on conservation, but on "mixed" types of bureaucratic rationality.

The evidence therefore does not bear against my hypothesis so much as it is irrelevant. More subtle techniques of analysis, once developed, could uncover it. That, however, necessitates a study in the conceptual or general areas of sociology (organizational) and a turning away from a substantive area. In any event the general

⁹ It should be remembered that an M.S. in biology may qualify an individual as Chief of Forestry or some similar post. Research is much more common in such instances than might be so with a comparable degree in sociology.

pattern of my evidence in Table 17 substantiates the hypothesis, while the qualifications do not so much qualify, as introduce a new problem.

Turning to Table 18, exactly the same analysis holds with respect to the data it contains, as was presented in Table 17. However, Table 18 contains only five states in its continuum: two in the highly industrialized bracket, two in the moderately industrialized bracket, and one in the least industrialized bracket. Only Kentucky and Tennessee are new additions to our data, but arranged with states already reviewed in Table 17 they give some further insight. Everything which applied to the previous table also applies to this one, and the reader is invited to inspect it without further exposition.

Table 19 compares six new states with reference to each of the sub-indicators discussed in the previous tables. However, unlike the former two tables, Table 19 involves paired polar opposite states with no mid-points on the continuum. Furthermore it involves states exhibiting very different amounts of wild land from those exhibited in the former table, the range being from 6,425,723 acres of Indiana to the 2,165,767 of North Dakota. Yet given even these small quantities of wild land the evidence could not be more strikingly in support of my hypothesis. Again the

data columns remain unchanged and the same analysis which applied to the former conservation tables applies to the latter. Only a few comments on the peculiarities of a handful of entries require discussion.

First of all it is evident that sheer size of state is of no importance in the matter of conservation rationality and control. The small eastern states respond to industrialization just as readily as the large midwestern lands. This can be doubly confirmed by referring again to the data on state parks (reviewed earlier in Table 1) in the cases of Massachusetts and New Jersey. Second, Vermont holds something like the position that Mississippi did in the former tables. That is, with respect to Massachusetts--with which it alone is being compared in this table--it has an impressive budget for a non-industrial state, but it shows little consistency with this in any of the other data columns. By the same token North Dakota--which is to be primarily compared with New Jersey, but which may be also compared with Vermont--is low on budget and research but high on degree ratio, clerical ratio, and high on absolute degrees. The reasons for this lie, in part, in the fact that in North Dakota the State School of Forestry is considered a conservation organization and has been included in the totals. Third, New Hampshire has a large private conservation participation--

larger in fact than the industrial state with which it is being compared, mainly Indiana. Possibly this reflects sheer eastern tradition, which like California has had fanatical bird watchers and preservationists; partly it may reflect double residency patterns by which New Yorkers owning property in New Hampshire for summer homes can claim residency or at least membership in local organizations.

It might be added that there is a slight tendency for the degree and clerical ratios to fall more nearly in line with the original hypothesis in Table 19 than was the case in the previous reviews. But the tendency is so slight as to offer no real hope.

Data on Taxation

In concluding the presentation of the data one last minor category must be reviewed.

Certainly the industrial states we have examined have more money to spend on conservation than do the non-industrials. Certainly, too, they spend more money on such activities. Could one argue that this is so simply because they are rich and therefore able to conserve while the non-industrials are poor and unable to afford such luxuries? That is in fact my hypothesis, or at least an aspect of it. But to put the question in another light: do the industrial states

have tax structures that make resource control, on a scientific basis, possible, while the non-industrial states are saddled with tax structures inimicable to such activities? Is tax structure the cause of conservation rationality and not industrialization? Or can tax structures act--to put the matter more weakly--as an intervening variable between conservation and industrialization of society?

I have no data on tax structure as such, but I do have the actual budget figures for the several states and that is as good. Thus the problem is essentially irrelevant for this study, since the industrial states have in fact high budgets and the non-industrial states have low budgets. Taxation structures appear to follow industrial structures, at least as regards conservation and resource control.

Nevertheless a few additional features are of interest in regard to tax matters. First, the entire point of this dissertation is that certain sets of conditions are invariantly associated with resource control. Either this is or is not the case and tax or other matters are of no importance unless they have an impact on this general correlation. Second, it is difficult, on general grounds, to imagine where the poor states are to get the monies (as well as why the rich states would not have the monies) to take an effective role in conservation. Industrialization

not only calls forth conservation, but it supplies the means to achieve it as well. Third, a review of state revenues and relative fiscal capacities (see Table 20) reveals that when state taxation is considered in terms of relative loads and relative possibilities the general point made (number two above) becomes specifically demonstrable. North Dakota--on all counts the least industrialized state--has pushed its fiscal capacity to the limit (\$158.57 annual state and local revenue per \$1,000.00 of personal income)¹⁰ while New Jersey, with a similar amount of wild land, has extended its taxation to less than half that of North Dakota and at the same time gets virtually no federal aid. Yet New Jersey is a state with a high degree of rational resource control. Certainly the taxes in North Dakota are heavy, yet they are not allocated to conservation.

There is also the example of California, which I have not studied in this survey but which is generally conceded to have a crack conservation program. In that

¹⁰"A significant measure of state and local government financing is found in the relationship between the amount of general revenue collected and the personal income of the state's residents. These personal income figures are widely recognized as a valuable measure of the approximate "fiscal capacity" of the states, and their relation to general revenue constitutes a significant indication of the proportion of available financial resources. . . .", Council of State Governments, The Book of States, CSG, 1960, pp. 190-91.

Table 20. Rank order of states by relation of general revenue of state and local governments to personal income (1957)--general revenue per \$1,000. of personal income. Federal revenues of states per \$1,000. of personal income (1957). And state per capita amounts of all general revenues (including federal--1957).

States	State and local general revenue per \$1,000. p.i.	Federal rev- enues per \$1,000. p.i.	State per capita amounts of all general revenues
North Dakota	\$158.57	\$22.31	\$259.12
Louisiana	141.05	24.43	259.28
Mississippi	137.26	28.17	159.85
New Mexico	133.51	38.76	296.44
South Dakota	129.37	25.67	240.51
Wyoming	126.18	41.78	341.22
Oregon	122.96	19.92	277.48
Montana	120.59	25.95	275.82
Nevada	120.04	25.27	358.82
Minnesota	119.11	12.90	244.50
Idaho	118.59	22.36	227.92
Oklahoma	117.67	24.94	232.97
Vermont	116.23	17.56	226.36
Arizona	115.30	16.94	243.88
Colorado	115.27	19.93	271.45
Kansas	114.28	15.18	235.32
Utah	113.86	19.39	228.74
Iowa	113.12	12.27	227.80
California	111.18	13.28	315.05
Washington	110.99	13.99	265.66
Florida	110.50	12.26	219.39
Wisconsin	110.34	8.46	228.18
South Carolina	109.41	16.74	148.95
Georgia	107.92	17.95	180.48
Arkansas	107.08	24.82	150.80
New York	105.56	6.20	283.44
North Carolina	102.40	19.84	162.00
Maine	102.36	14.04	194.36
Tennessee	100.89	16.89	163.89
Michigan	99.74	8.56	234.81
Massachusetts	99.52	7.73	252.45
Alabama	98.18	24.40	161.70
Texas	97.61	14.37	199.72
New Hampshire	95.65	9.81	196.02

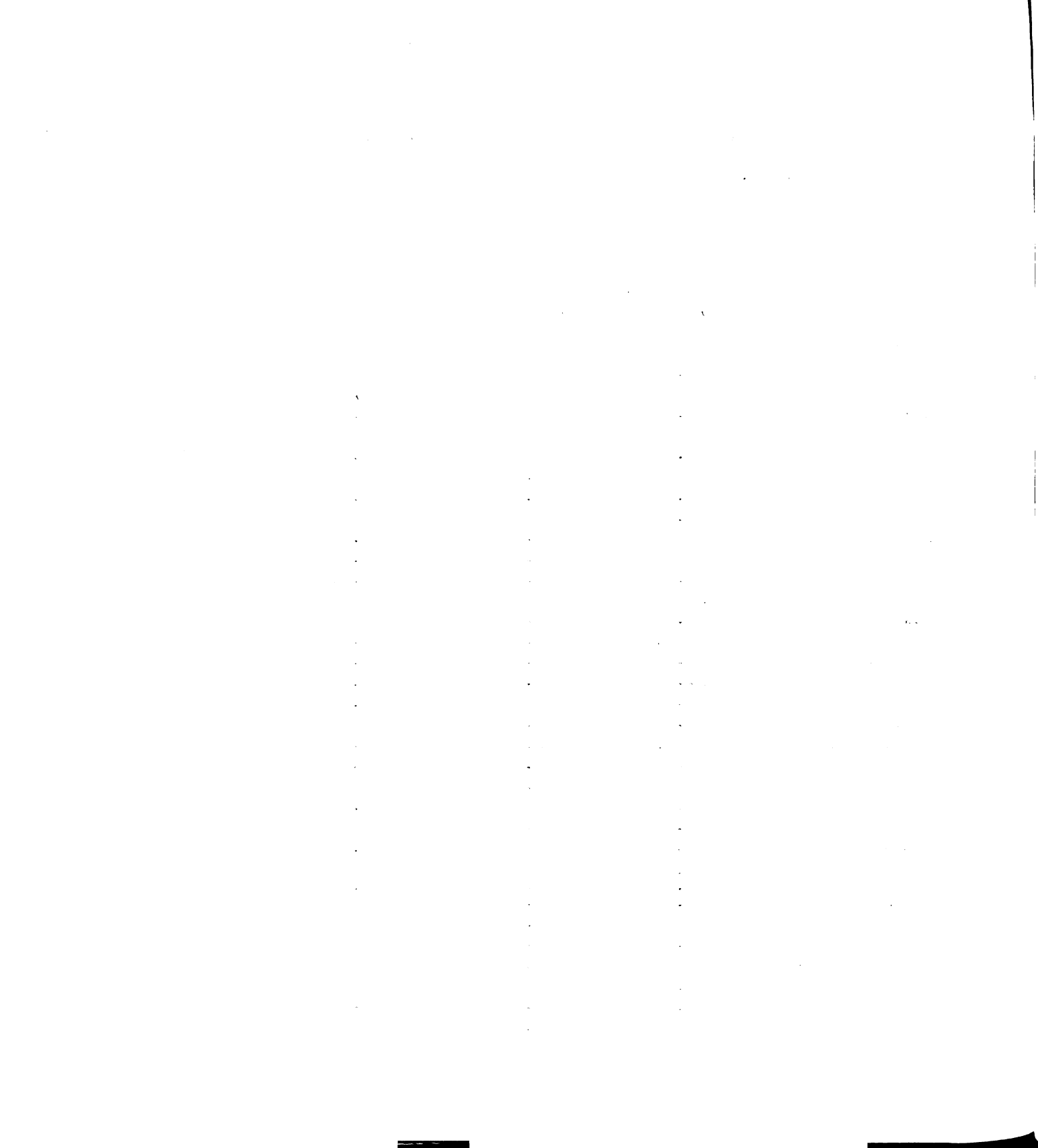


Table 20. Continued.

States	State and local general revenue per \$1,000. p.i.	Federal rev- enues per \$1,000. p.i.	State per capita amounts of all general revenues
Virginia	\$ 95.55	\$ 9.84	\$226.36
Kentucky	94.00	15.96	150.76
Nebraska	93.27	12.79	194.86
Maryland	88.28	8.12	207.85
Pennsylvania	87.07	6.00	197.16
Indiana	84.64	6.19	183.58
Rhode Island	84.34	11.73	192.25
West Virginia	84.17	12.25	150.85
Illinois	83.08	6.20	217.05
Connecticut	82.81	4.77	245.18
New Jersey	82.10	3.99	215.93
Ohio	81.97	7.11	200.77
Missouri	77.71	15.36	181.31
Delaware	67.96	6.79	206.68

Source: The Book of the States--1960-61, Council of State Governments, 1960, Vol. XIII, Table 4, p. 196, Table 4, p. 196, and Table 3, p. 195 respectively.

state services are plentiful and state costs in taxes quite high, yet unlike North Dakota, there is no lack of conservation. Either taxation structures are dependent variables or they vary randomly, but they appear to have no very direct effect on resource control. At any rate the matter is unimportant for this study since the budget data settles the question.

Conclusions: The Nature of Resource Control

The review of the empirical data is now complete. There remains to be drawn the conclusions to which these data conduces, and the implications of the additional propositions that were presented in review of the empirical problem.

So far as the contemporary scene is concerned the relation between industrialization of society and rational--in its new and weaker sense--resource control is proven. Of course this applies only to the states of the United States and technically only to those that were surveyed, yet the probability remains that what is true for the sample is true for the whole. At least on the data presented, increases in conservation activity--both publically and (it would seem) privately as well--are closely related to increases in relevant industrialization.

Thus for the contemporary United States one of the key determinants of a social movement has been established. There remains to be considered the implications which this has for the historical conservation movement. Clearly, contemporary data on a social movement cannot be passed off as historical fact. What it can do is call attention to certain present relations which may make us more sensitive to past events.

The conservation movement is generally pictured by its historians and expositors as a fight of the old rural middle class against the overwheening concentrations of wealth and monopolistic power on the eastern seaboard. Liberal ideology has consistently maintained this image, and until 1959 no single historian had broken this faith. The fact remains that what had been considered obvious evidence for the pictured battle of farmers and small businessmen against the east is anything but conclusive. Most frequently, historians, as Hays pointed out, took the illicit ownership of land--a fact which no one could deny--as immediate evidence for poor conservation policy. Yet what shrewd dealing, in the acquisition of land, has to do with its use is never stated. Roy Robins in Our Landed Heritage, perhaps the single most impressive review of land policy and land history in the United States, simply assumes (Part III, "The Corporation Triumphs")¹¹ that such a connection exists, and like most liberal expositors champions the populist sanity and yeoman virtues of the smallholders.

Today liberalism holds, as a key article of its faith, this conservation story. Hardly any month went by during the Eisenhower administration in which the liberal

¹¹ Princeton University Press, 1942, pp. 203-300.

press did not print dark thoughts on the rapes and give-aways of our "landed heritage." Examining the controversy--as on Dinosaur National Monument--the battle was not between yeoman and monopolists but between competing conservationists. And frequently it was not over conservation at all but ownership. Where the chips will finally fall on this controversy is open to question. What I propose is simply this:

First, if today we ask which states have the largest industries and the greatest concentrations of wealth and capital power, we find that it is those same states that have the highest level of rational resource control. They spend more money, do more research, employ more people, use more science, have more private conservation activity, and possess more professionalized staffs than do any of the states that predominate in small farmers, small businessmen, and small industrialists. Perhaps this is not history as it was, and perhaps the big states have learned from the past, but then, on the other hand, perhaps things were never quite as they have been pictured.

Second, Samuel P. Hays' (op. cit.) study of conservation leadership arrives at a similar conclusion with respect to the history of the movement. The leadership was not, he argues in Conservation and the Gospel of Efficiency, ever of the west, the south, or the populists. It stemmed instead

from scientists and technicians centered in Washington, D.C. who had the ear of the first Roosevelt and who, like Roosevelt, wished to see the rational adjustment of resource claims. The supposed connection between these men at the national level and the populists in the field has, Hays points out, never been demonstrated.

Third, both Schumpeter and Gailbraith--and others--have argued that monopoly is the stable situation of large scale capitalism. And that not only is it stable--in terms of concentration--but it is also more efficient. What this means for the conservation movement is simply this: without monopoly--on theoretical grounds alone--there is strong presumptive evidence against the rationality potential of small competitors. Yet small competitors have been pictured as the backbone of the movement. Something has to give or the contradiction remains.

Fourth, monopoly not only suggests security of market but concentration. Even the most elementary principle of organizational theory supports this contention: the greater the concentration, the greater the perception. Every study ever done of participation in organizations shows a correlation between knowledge of the situation and the position of an individual. Surely the same type of idea is acceptable with respect to economic enterprises, urban

administrations and other large collectives. Thus the greater the size and concentration of the units involved, the greater the likelihood of planning for the future. And one way of planning is through conservation of the necessities of your organization (whether water, minerals, or game).

In other words, four kinds of propositions--two empirical and two theoretical--give us grounds to question the entire philosophy and ideology of the conservation movement. What conservationists wanted may be good, true, and beautiful, but their presuppositions are certainly open to question. My marshalling of four arguments against the popular picture of the movement cannot be called conclusive, but they ought at least be taken into account in future considerations.

Finally, before turning back to the analysis of social change theory a word on the strictly contemporary implications of the research are in order. We noted at the conclusion of the empirical design, that if the correlation or lawful regularity connecting industrial society and rational resource control were confirmed, then this confirmation would fit into a larger regularity. Weber's conception of the increasing rationality of western social organization was that larger regularity, and the success of this research would give further support to Weber's. It was

also noted that "rationality" was only the empirical name given to increases in the use of science and bureaucratization of organization, and perhaps--though this was only implied, not explicitly stated--in concentration of control (i.e., power). What finally then does the evidence on this question support?

If we take the concept we wish explained, mainly "institutionalization of rational resource control," we can now specifically rally the findings. First, as regards institutionalization in both senses (regular and public), all of the conservation organizations--high and low--possessed both characteristics. This is to be expected in public structures and thus gives us no new understanding one way or the other. Second, as regards rationality, it was noted that support for its close tie to the industrialization of society existed in three separate and important respects: (a) in the form of research budgets as indicative of scientific rationality, (b) in the form of absolute numbers of degrees in higher education as indicative of scientific rationality and the application of general knowledge, and (c) in the form of professionalization as an organizational alternative to bureaucracy--all of these factors applying to states with nearly identical amounts of wild land. Third, as regards control two separate and important aspects confirm the correlation: (a) absolute size of budget relative to a

fixed quantity of land, and (b) absolute size of staff in public, and membership in private, conservation organizations.

Thus with respect to Weber's conception, the evidence is affirmative in all respects except that of strictly bureaucratic rationality--and that because, in all likelihood, a "mixed" or alternative professionalized structure predominates in public conservation organizations.

CHAPTER IV

UNIFIED SCIENCE, SOCIAL CHANGE, AND THE MOVEMENT

We may now return to the larger concern of this dissertation: how to handle the problem of change in sociology.

We had noted at the conclusion of the first section that an endemic interest of present-day sociology is the dispute between the functionalist and the conflict theorist. This altercation centers around the solution to Parmenides two-thousand five-hundred year old dilemma: "what is, is" (statics); "what is not, is not" (literally, "is nothing"); "how then, can something change into that which it is not" (flux)?¹ Dressed up for moderns this dilemma reappears in the lament for the "laws of change." The functionalists insists on homeostases, self-regulating systems, steady states, boundary maintaining entities, cohesions, and equilibriums; the conflict theorists insist on a Heraclitian

¹This early problem in Greek philosophy is not offered in jest. I quite seriously mean that it is the identical problem that puzzled the Greeks. It is not puzzling to philosophers or to most scientists today, but it is still with us in sociology: John Burnet, Early Greek Philosophy (The Meridian Library, 1957; first published St. Andrew, 1930), pp. 169-96.

world of flux in which one never steps into the same social structure twice (permanence being an illusion of conservatives, reactionaries, and utopians).²

But functional and conflict theorists are not the only thinkers caught in the dilemma of change and permanence. Chapters dealing with the supposedly distinct and separate area of social change are to be found in an endless number of textbooks and monographs written by persons not formally identified with either theoretical position. And it does not end there. Numerous volumes in anthropology as well as course titles in both fields proclaim "social change" (or "cultural change") to be a distinct and separate focus of investigation.³

²Ibid., pp. 130-68; also see: Bertrand Russell, A History of Western Philosophy (Simon and Schuster, 1945), pp. 38-52.

³At random one may find an embarrassment of riches in this pseudo-field: Raymond Firth, Elements of Social Organization (Watts & Co., 1951), pp. 80-121; Paul H. Landis, Introductory Sociology (The Ronald Press Co., 1958), pp. 44-83; Alfred Lewis Kroeber, Anthropology (Harcourt, Brace & Co., 1948), pp. 386-444; E. Adamson Hoebel, Man in the Primitive World (McGraw-Hill Book Co., Inc., 1958), pp. 559-622; Ralph L. Beals and Harry Hoijer, An Introduction to Anthropology (The Macmillan Co., 1959), pp. 660-89; George A. Lundberg, Clarence C. Schrag, Otto N. Larson, Sociology (Harper & Brothers, 1958), pp. 693-748; Ronald Freedman, et. al., Principles of Sociology (Henry Holt & Co., 1956), pp. 261-81; Kimball Young and Raymond W. Mack, Sociology and Social Life (American Book Co., 1959), pp. 87-107. Notably, Leonard Broom and Philip Selznick, Sociology (Row, Peterson & Co.,

I have presented an investigation of a problem in "social change." In it I have not once alluded to social change in the conceptual apparatus of the proposed investigation. Instead I have written about concomitant variation of two phenomena. And indeed, I shall never have to do more than this to handle a problem commonly agreed to be concerned with social change. This is possible because in the background of my formulation, and execution to come, I have utilized a language of scientific discussion which has eliminated the Pre-Socratic dilemma. This elimination has come about by the simple but elegant expedient of using a vocabulary that is neither ambiguous nor suffused with a perspectival bias. My pride in this vocabulary lies only in the fact that it is a proven instrument. As a background for scientific investigation it is the most mundane of all the languages of science, yet it alone offers a vocabulary of science that allows us to argue about science without semantic confusion.

To make this point clear, let us now introduce five

1958) make no mention of change whatsoever. It is no wonder, for after formulating their book around the presentation of a series of generalizations in the several areas of sociology, to add a chapter on change would require a second text printed exactly as before but with the word "change" in the chapter headings. Needless to say, my list is only partial, but it is typical.

concepts from the Unified Science Language. In this introduction there will be no profound neo-logisms, no semantic esoterics. Yet with them we can adequately handle everything that I have been proposing and many other issues, problems, theories, and methods in the sciences.

The five concepts of the language I am about to discuss achieved their present status from the work of scientist and philosopher alike. Both groups were concerned with developing a language which could be used to discuss science as a cognitive pursuit. Both perceived the inadequacies of alternative languages. Both were strong adherents of the belief that science had a common method and a common aim. The problem of understanding what the scientist was doing when he went about his business was their chief motivation. They sought in common and after some faulty starts achieved an instrument in which to express this common pursuit.⁴

What was this common method and aim? Two general concepts express the aim of science. Three others express the means by which this aim is achieved. None of the five should be strange or difficult.

First, the aim: explanation and prediction. Scientists, indeed men of knowledge generally, aim at explaining events

⁴Review footnote 11.

and regularities and predicting the same. Second, the method or means. Events and regularities are explained or predicted by (a) observing the facts, (b) organizing and abstracting from these facts in the formation of concepts, and (c) linking concepts into patterns of regularity called laws. Some sciences do more than this, they construct theories by means of appropriate deductive tools, but that is beyond anything that has occurred in the social sciences (Parsons and the functionalists not excluded).

By briefly examining these five concepts--and referring the reader to the more exacting analyses of the literature--we will have at our disposal the essential concepts of the USL that we need to comprehend the problem of change. With it any problem of a formal or analytic nature in sociology or anthropology can be greatly clarified. Being a language about the substance of empirical investigation it cannot, of course, solve empirical problems. Only empirical research can do that. But it can accommodate any of the abounding semantic problems of sociology, of which social (or cultural) change is one. If one forces himself to think in this language, there need never arise again the "eternal recurrence" of the semantic pseudo-issues which are so common a feature of the landscape. And one can only hope that because the philosophers have had their hand in this venture--they are

after all the present day masters of the analysis of meaning-- immediate judgment will not be passed down. They have cleaned their boots of their past mistakes; they have something to teach us. But we can be taught only if we will pause long enough to listen.

Facts are first. They consist of immediately given sense data. They are, in themselves, unique and non-reproducible. They are the stuff of experience: e.g., The Michigan Conservation Department has 21 Ph.D. degree holders; there are no departments of conservation in some states; California has 121 clericals working in its Department of Fisheries and Wildlife. Concepts are quite different.⁵ They do not involve the unique and non-reproducible; they are class terms. Class terms may be described as involving a "constant conjunction of characteristics."⁶ "Gold" is, for instance, a concept. It is a constant conjunction of characteristics--characteristics being facts from which abstractions have been made--such as a certain ductility,

⁵For concept formation any of the major works cited in footnote 11 have sections on the logic of concepts. However, see: Carl G. Hempel, "Fundamentals of Concept Formation in Empirical Science," International Encyclopedia of Unified Science, Vol. II, No. 7 (University of Chicago Press, 1952).

⁶Morris R. Cohen and Ernest Nagel, An Introduction to Logic and Scientific Method (Harcourt, Brace & Co., 1934), pp. 245-49.

tensile strength, color, specific gravity, and so forth. In these terms "institutionalization of rational resource control" is one concept and "industrial society" is another. The constantly conjoined characteristics are those listed as the indicators. I defined the two concepts so as to include these characteristics--based, of course, upon some reasonably well ascertained facts--and I am interested in seeing if there is some sort of conjunction between them. This conjunction between concepts is, if verified, a law: and if not, or until it is, it is called a hypothesis. Laws then, link concepts into patterns variously referred to as invariant relations, regularities, correlations, causal connections, generalizations, linkages, relations; but for the present purpose merely "laws."⁷ Sometimes these laws, when they are very general, that is, when they cover a wide range of phenomena, are referred to as theories. This is quite incorrect usage from the point of view of strict Unified Science, but it is done and I have done it in this proposal. Technically, theories are another sort of animal altogether.⁸

⁷For discussion of laws see any of the discussions in volumes footnote 11. Also: Readings in the Philosophy of Science, op. cit., C. G. Hempel, et. al., pp. 319-52.

⁸The best discussion of theory of which I am aware is contained in Braithwaite, op. cit., footnote 10, pp. 22-114. Also for both theory and concepts as well as fact

The social sciences have virtually no true theories, certainly none in sociology and anthropology.

Another error is often made with regard to the use of the word "generalization." Generalizations are related to laws in a special way. They are not really different from them except in a specific formal sense. It is this: a generalization has only instances which stand to verify it ("I have seen 500 crows that were black, therefore all crows are black"--the last clause is the generalization for which 500 instances stand as verification); a law on the other hand is deduced from a generalization by the rules of logic. It, therefore, has not only the instances standing for it but the deduction as well ("Black birds survive best in environments with little light; I have seen 500 instances of this; crows are black birds; therefore, crows survive best in environments with little light--and this precisely because they are black birds").⁹

At this point we have three very briefly explicated
USL concepts, and a few very closely related secondary terms

statements see: Karl R. Popper, The Logic of Scientific Discovery (Hutchinson & Co., 1959), for facts: pp. 93-111; for concepts: pp. 59-76; for laws: same discussion as concepts; for explanation and prediction: also same discussion; and for the nature of the USL in general see Chapter II, pp. 49-58.

⁹This particular explication is borrowed from Braithwaite, op. cit., pp. 202-03.

that were discussed in the context of the primary three. These are the tools with which we will examine how the ends of science are to be achieved. That is, it is by means of facts, concepts, and laws that we explicate the meaning of explanation and prediction.

To begin with, explanation and prediction have the same logical structure. All that divides them is a temporal factor. If one wishes to understand scientifically an event--an "event" being a fact or set of facts--after it occurs, we call this an explanation. On the other hand, if one wishes this understanding before an event occurs we call it a prediction. But the logical or formal apparatus is identical.

Before examining this apparatus, another notion is necessary. We have already discussed it in examining the concept, fact. Facts, as dealt with before, were unique events from which we abstracted in developing concepts. Now we must use the concept of fact for a different purpose. This purpose is called by a variety of names: "facts of the case," "initial conditions," "antecedent conditions," "starting conditions," and so forth. Another way to put the matter is to designate the problem to be explained or predicted, i.e., the facts of the case. Now we are ready

to move.¹⁰

To explain or predict three things are necessary:

1. A general law.
 2. The problem, facts of the case, initial conditions, etc.
-

3. Deductive consequences of #1 and #2 above.

If #2 was acquired before the events of concern took place, the result is a prediction; if afterward, the result is an explanation. In both cases, problems or events to be explained or predicted are subsumed under general laws, and such acts of subsumption are all that is meant by the aims of science.¹¹

Let us now apply this. My facts of the case, initial conditions, or problem is: how do I explain the resource control differentials by states? The answer is: by first collecting the data or facts on the states (initial conditions) and then subsuming them under a general law. The law, in

¹⁰For formulations of explanation and prediction see any of the following: J. W. N. Watkins, "Ideal Types and Historical Explanations," in Herbert Feigl and May Brodbeck, Readings in the Philosophy of Science, op. cit., p. 723; in the same work see: Carl G. Hempel and Paul Oppenheim, "The Logic of Explanation," pp. 319-324; and again Braithwaite, op. cit., pp. 342-68.

¹¹Ibid., pp. 347-50.

this case, is none other than my correlated concepts of resource and industry.

Let us grant that this correlation is true (actually it makes not one jot of difference if it is true or not, the logic of explanation and prediction being a formal concern in either case). My problem is, how to explain the resource movement by states (each state being a separate problem or set of initial conditions). I do this by simply deducing from the general law and the initial conditions of the particular states the consequences. Example: Michigan is a highly industrialized state; it also has a high development of rational resource control; this is to be explained by subsuming this particular set of facts or problems under a law. The law states: in all cases--under control conditions--where there is a high degree of industrialization of society there is also a high degree of institutionalization of rational resource control. Michigan is an instance of the former (the initial conditions); therefore, Michigan must necessarily be an instance of the latter (deduction). The event is explained. It has been subsumed under a law, i.e., deduced from a law.

But laws not only explain initial conditions, problems, or sets of facts. They explain laws themselves, and by an identical process. Suppose now we want to explain the (let

us call it by this name) "law of resource control." We proceed as before. Only now the law itself is the problem to be explained. Therefore, we need a more general law to explain it, one from which it can be deduced. Fortunately we have it: Weber's law--for that is what his argument is--of the increasing rationality of the industrial order. Our law is deduced as a specific instance of this larger regularity in society. And Weber's regularity in turn might also be subjected to the same treatment if we had a still more general law. Incidentally, relative to Weber's correlation, mine is formally a law and his a generalization as explained above.

In the matter of prediction one proceeds exactly as before, only the facts of the case or initial conditions have not yet transpired. Thus, you merely word the question differently. If there were a state that were little industrialized, or there is a state but I know only that it is non-industrial, therefore, it should have a low development of institutionalization of rational resource control. One may go out and "test" the consequences of this prediction. But, except for the temporal factor, the logic is identical to that of explanation.

Incidentally, it is possible to have laws of any degree of generality (or specificity) so long as all the actual or

potential cases to which they might apply have not yet been observed. Therefore, a law which applies to only one society is still a law, and it will have been such even if that society goes out of existence or if the law is expanded to cover yet other societies. A law, to be a law, need only apply so long as the entities to which it refers exist. Temporality is not a feature of laws.¹²

If the reader has followed these formal yet elementary propositions this far, a fact may have been noted. We have discussed the resource control movement in terms of what science is about without once reverting to any conceptual category such as "social dynamics," "cultural change," or "social change." We have done this by pointing out that particular cases of high (as well as low) development of resource movements are related to the general law of resource control.

How can this be? Social movements are the essence of social change! Has all the reality of the world dropped through the sieve of a formal essay in logic chopping? Not at all. None of the real stuff of the world has vanished, but some of the unreal has. At least nothing as unreal as

¹²See: Edgar Zilsel, "Physics and the Problem of Historico-sociological Laws," in Feigl and Brodbeck, op. cit., pp. 720 (footnote).

looking for distinct, separate, unique, and special laws of social change has occupied us. The implication must be clear. It is not that change is unreal--after all we do talk this way and apparently with some meaning--but rather that if you know the laws of society then you also know the laws of change (or statics) as well. You know this because you know how to explain and predict events and regularities--in this case social ones--and that is all any science does or can do!

Is this a trick, a slight of hand by which I have made speciously simple the complex truths of change and statics? Well, it is a slight of hand in the sense of any semantic clarification (which may be far from "slight"). It is all still there: change, statics, equilibrium, alterations, conflicts, and functional balances. But it is not any different from any of the generalizations of science. The world is just as rich as ever but it is not cluttered with issues about which mis-guided theorists write endless essays. The problem of social change in sociology or anthropology is like the problem of negative weights: there is no problem.

How, then, did it arise? It derived from the use of an obfuscating meta-language in the discussion of the nature of science. Functionalism and conflict theory are not

empirical theories. In themselves they make no specific claims about the empirical world. They are perspective theories. We cannot ask of them, are they true or false. That is like asking: are the rules of football true or false? It is meaningless. What we can ask is, do the rules facilitate the game we wish to see played? And the game we wish to see played is science. Do functionalism and conflict analysis facilitate this game? No, not if we judge by the problem of change. Do we have a set of rules that do? Yes, the same one as the other sciences, the USL.

But not to be dogmatic, let us look a little closer at the problem of change. Let us subject it specifically to analysis by means of the USL and try to see why the question has cropped up and continues to crop up. One suggestion as to the social sources of this idea comes from meta-linguistics. Bertrand Russell has argued--only to be castigated by Lewis Feuer for jumping beyond his limited and correct idea to a general and incorrect one--that the subject-predicate structure of the Indo-European languages of the West have led us astray.¹³ We have in such languages nouns

¹³ See: Lewis S. Feuer, "Sociological Aspects of the Relation Between Language and Philosophy," Philosophy of Science, Vol. 20 (April, 1953), pp. 85-100. This remarkable essay constitutes very damaging evidence against the empirical claims of meta-linguistic extremists. It does not, however,

or subjects to which predicates or adjectives are affixed. The noun somehow remains the same and yet it suffers alterations by predicates. This characteristic of our language may have led to the concept of substance in philosophy--an underlying substrate without properties or predicates, the changeless stuff of ultimate reality. At any rate it is now embedded in our words "change" versus "permanence," "becoming" versus "being." And if we can use such words, then why should there not be a reality behind them? Heraclitus and Parmenides fell into this trap two thousand, five-hundred years ago, and so have others: was the world a flux or was it an unchanging reality. If one chose the former, then permanence became an illusion, if the latter, change the shadow.

Later thinkers argued that the problem was real but that one or the other side was repeatedly wrong. The positions often took on political implications: conservatives, reactionaries, and utopians opted for permanence, while revolutionaries and anarchists plugged for change. This is where we are today, ~~two~~-thousand five-hundred years later. The eternal recurrence is complete. And a small version of

explore as deeply as one might wish the logical problems. See also: H. Hoijer (ed.), Language in Culture (University of Chicago Press, 1954).

the rebirth of old issues is to be found in the history of poor, brief sociology itself: the early organicists and the conflict advocates gave way to their earnest contemporaries, the functionalist and the neo-conflict theorists.¹⁴

The solution to the change-permanence dilemma is this. First of all we must agree that men have something in mind when they talk about "change and permanence." We must preserve this real "something" in our analysis and yet not get trapped in our own verbage. Let us take a familiar problem and analyze it in our newly introduced vocabulary.

We buy an automobile. It is shiny, clean, runs well and we say it is new, as yet unchanged. Five years later it is a rusted, clanking, dented in hulk and we say it has changed. What precisely do we mean by this statement? We mean, I believe, that a number of events (facts) have occurred with respect to this car such that it is not what it used to be. Our job is to explain those events. Now events are merely initial conditions, facts of the case, or problems to be explained. The laws by which we explain them are

¹⁴"With sociological functionalism, it is difficult to escape the impression that the circle is complete and sociology has returned to the point of view of its founders." Don Martindale, The Nature and Types of Sociological Theory (Houghton Mifflin Co., 1960), p. 537. The cynic might argue that the return is not only to the founders but to the founder's confusion.

well known. They include many of the concepts of our physical world linked into patterns of regularity: laws of mechanics, chemistry and others. We examine the history of the car, history being merely the duly listed chronicle of events (to be explained) placed in order of occurrence. For each event in the car's history we apply or try to apply the appropriate law (assuming we have such), and by means of a simple deduction or subsumption we have explained the events. The sum total of the events when explained constitute the "change" about which we may be proud or chagrined.

The question now is: are these laws that did this explaining separate, distinct, unique, or fresh conceptions of the world? Must we study them as such, write chapters about them, teach courses organized around them? Nonsense! They are the same laws that have been around all the time. They are the laws of physics and chemistry, not laws of change, not laws of statics or equilibrium, just laws.

And so the same may be said for permanence. We buy the car, put it in the garage, leave it there covered and sealed. Five years later we uncover it and see that it has not changed. The car is a static entity, an unchanged unit of our experience. Why? Because it has no history of events to reveal, nothing to explain, no laws to apply. We catch this sense when we talk (however incorrectly) of a people

without a history, a people that remained nearly the same-- of course, search hard enough and some "events" will be brought to light, because it depends very much on what we want to call an event in the history of a people or a car. Change and statics are strictly relative to our interests in "keeping the record" of events as they relate to some object upon which we choose to concentrate.

Does the same analysis apply to societies? Western society changed, we say, from feudal to industrial; by the use of our words we catch two permanences with some events in between. How to explain this shift? We follow the same procedure as before, though it is a more difficult problem than the case of an automobile. It is hard to get all the facts or events as they developed. And we do not know the laws of society so well. But if we did--and we do know some--the process would be identical to that of a physical object's change. The laws we might suggest involve linkages between concepts from various orders: economic and religious, religious and legal, strata and technology, and so forth. They are the sociological generalizations and hypotheses that we employ, or attempt to employ, everyday. History is simply a lot of problems to be explained.

And this brings us to the crux of the matter. Change and statics result merely from our interest and our point of

view.¹⁵ If we are "pure scientists" we are interested in explaining particular events and developing laws in and of themselves. No change and no statics to worry about in such a pursuit, just as there was none to worry about in the study of the resource movement. But many of us choose to focus on time slices of particular events in and of themselves: feudalism and industrialism. It is this focus alone that results in our semantic confusions. By asking for laws which explain how seemingly solid and stable nouns ("feudalism, industrialism") change into something else, we are concentrating on end events. By focusing on the two end events of a time slice we seem to have two stable units, two functional wholes, two steady states. But science does not ask what is steady and what is changing; it is concerned only with explanation and prediction, and this applies to every event we wish to select. Whether all is change and flux, or whether all is stability and permanence is really a meaningless question. And if we fool ourselves into thinking that there is something different about explaining events as steady states,

¹⁵ A number of analysts have recently made the point that functionalism--or conflict perspectives--are the result of our interests, and therefore of the questions we pose. This, they are, but nothing more. In this sense they are to be condemned as offering unique or special focuses of attention. Nagel and Hempel (cited) stand out, see: footnotes 6 and 10, Nagel, 1956.

if we believe that different laws are required than are required for explaining the period in between such steady states, then we are the dupes of language. For to explain events in the steady state or in the period in between is one and the same thing. Events are events; they are explained in only one way in this world--though we may talk about the process in diverse language--that is by subsuming them under regularities, and those regularities themselves under still wider ones. And what applies to permanence applies to change. Both concepts are artifacts of the language we use. If they gave us no trouble, and some thinkers slide easily over them, all would be well.

Unfortunately we find courses, books, and chapters devoted to a special area of social change. I for one have been long puzzled as to why the authors of these documents were not troubled by the unlimited nature of their field, why they were not disturbed by using so many of the same generalizations in this area as in the other divisions of sociology or anthropology.¹⁶

And to compound the confusion we have entire meta-languages that are devoted to the discussion of these

¹⁶ See Don Martindale, Social Life and Cultural Change (D. Van Nostrand Co., Inc., 1962). This recent work is one long series of generalizations about intellectuals in ancient society, with the word "change" attached.

problems. Functionalism handles permanence; conflict takes on change. Since these are not substantive theories, all one can wonder is why?

For if the functional and conflict protagonists understand science at all, they will understand that change and steady-states are artifacts of the kinds of questions we ask, the type of vocabulary that we use. In a perfectly legitimate sense they are the result of a bias that focuses on what are supposed to be "wholes" or "homeostatic systems" as though they were some unique and peculiar event of the universe. And conflict analysis, in responding to this bias, simply answers error with error. But this is not the place to explore the general problem of the poverty of functional analysis (and conflict theory's response). Besides, it has been very well done for me by a number of analysts. All their efforts bear out the contention that functional analysis and functional systems are the myths of our provincialism; in fact, I have elsewhere already argued this position.¹⁷

But if one uses the USL--the commonest meta-language of empirical science--this problem never emerges. Change and permanence alike are consigned to the semantic dustbin.

¹⁷ Kim Rodner, A Critique of Motivational Theories in Social Psychology (unpublished M.A. thesis, Michigan State University, 1959), pp. 73-115.

For the consistent use of the USL must always lead a scientist to search for explanation and prediction, and there is no mystery how they are achieved. The question of how something changes is merely a question of applying a series of laws to a history of events concerned with some entity that we choose to pursue. And the problem of statics is equally meaningless: how something remains static or unchanging is not to be sought in some esoteric "equilibrium" concept, but in the way we write the histories of the situations that concern us. As in the case of the automobile in the garage, all the "changes" that had taken place with respect to it (perhaps a layer of dust) are ignored, left out of the history. They appear unimportant, and we feel that they are unimportant precisely because from our point of view (how a car becomes a wreck) they most assuredly are. Thus change and statics are products of our interests, even of our provincialism. And by utilizing the USL we employ an instrument that eliminates such provincialism by eliminating ambiguity and perspectival bias.

CHAPTER V

CONCLUSIONS: PROBLEMS AND PSEUDO-PROBLEMS

The history of science since the Renaissance has alternated between periods of theory building and factual mopping-up actions. It is not often realized that much of this advance resulted from the pure analysis of meaning, and not from empirical tests or patient fact grubbing. Bertrand Russell has several times pointed out--as have others--that the most recent revolution in physics was the result, not of new empirical finds (that came later), but of the examination of a meta-language, a pure exercise in analysis. The architect of this revolution was, of course, Einstein. For in his Special Theory of Relativity he spent his major effort analyzing the meaning of space and time, and since he was an empiricist, Newton's notions and metaphysics had to go. Percy Bridgman picked up the idea and coined a term to characterize the method by which Einstein had achieved his results, he called it "operationalism."¹

¹See: Ernst Mach, "Newton's Views of Time, Space, and Motion," in Feigl and Brodbeck, op. cit., pp. 165-70; Hans Reichenbach, "The Philosophical Significance of the Theory of Relativity," (same volume), pp. 195-211, in particular:

Bridgman's operationalism was destined to become one of the contributing elements to the new look in modern philosophy and science. But more than that, it became apparent that empirical concerns in science are only as good as the questions asked. It became obvious that meaningless questions could never be tested, no matter how cunning the experimenter. It is unfortunate that so little of this interest has seeped down to the social sciences, especially to the theoretical orientations of today; unfortunate too that the use of the USL--the combined result of these philosophers and scientists efforts at developing a clear context for scientific debate--has not become sociological second nature to many thinkers. If it were, if all scientists forced themselves to think in terms of this wider context of science, many of the problems that plague us would have vanished with the eternal recurrence of old ones.

I have presented a proposal for the investigation of an empirical relation, a law. Not yet a general law until

"The logical basis of the theory of relativity is the discovery that many statements, which were regarded as capable of demonstrable truth or falsity, are mere definitions."; also Bertrand Russell, The ABC of Relativity (The New American Library, 1958), pp. 114-22, 138-44. And for a general treatment see: E. A. Burtt, Metaphysical Foundations of Modern Science (Doubleday Anchor & Co., 1954).

further instances are examined, but having the structure of a law nonetheless. Men interested in the preservation of the natural world, for whatever reasons, have been many. Few of them appeared to have hypothesized that their actions were deeply influenced by the process of industrialization within their society. Yet the evidence bears this hypothesis out. Thus, an explanation has been established for some past events, and a predictive base worked out for some future ones. This is all we do in science, though we do it at various levels of generality. Change and permanence cease to be mysteries when we view the world in this manner. In fact, once our semantics are in order, such pseudo-problems simply dissolve.

There are other reasons besides permanence and change for being displeased with using functional and conflict analysis as the meta-languages of our science. Such reasons call into question every supposed advantage that either perspective is said to confer.² For all they are really

²In this proposal my attack has been directed against only one aspect of functional or conflict perspectives. Yet one cannot escape the conclusion that the change is not the only problem of these meta-languages. The sweeping condemnation of both perspectives is long overdue. All the evidence is on hand, all the work has been done--for these, as we have seen, are not empirical but analytic problems. It is difficult to escape the conclusion that the failure

asserting (the only residual meaning that can possibly be given) is that they both urge us to seek connections between events in the world, i.e., laws. But what a Welsh Rabbitt this is, for what is any science doing? Yet even aside from the sweeping condemnation which many feel these perspective theories richly deserve, they have led us badly astray on the problem of permanence and change. That is enough to make any reasonable person suspicious of their utility.

to eschew these intellectual systems is due mainly to certain sociologist's inordinate failure to read anything but sociology. The change problem is one instance; there are many others. To break the provincial boundaries of our conceptualization five titles would suffice: for general background, Richard Bevan Braithwaite, Scientific Explanation (Cambridge University Press, 1953), or Ernest Nagel, The Structure of Science (Harcourt, Brace & Co., 1961); then, for careful understanding of the nature of the specific problem, Ernest Nagel, "Telological Explanation and Teleological Systems," Readings in the Philosophy of Science, by Herbert Feigl and May Brodbeck (Appleton-Century-Crofts, Inc., 1953), pp. 537-58--also an excellent background volume. Following this two other aspects of the same specific problem should be explored, "Causal and Teleological Explanations," pp. 319-40 in the Braithwaite volume just cited, and Ernest Nagel, "A Formalization of Functionalism," in Logic Without Metaphysics (The Free Press, 1956), pp. 247-86. These essays should then be followed by Carl G. Hempel, "The Logic of Functional Analysis," in Llewellyn Gross, Symposium on Sociological Theory (Row, Peterson & Co., 1959), pp. 271-307. If after finishing this reading, the student of social theory thinks that functional (or conflict) analyses have anything to offer, he must indeed be a true believer. Alternative vocabularies they may be, though ambiguous and confusing. But more than that they are not. And as Hans Gerth would say, "At that moment, . . ." at that moment one must make a choice. To support the orthodox confusion or endorse the Unified Science Language and leave the shadow boxing to others.

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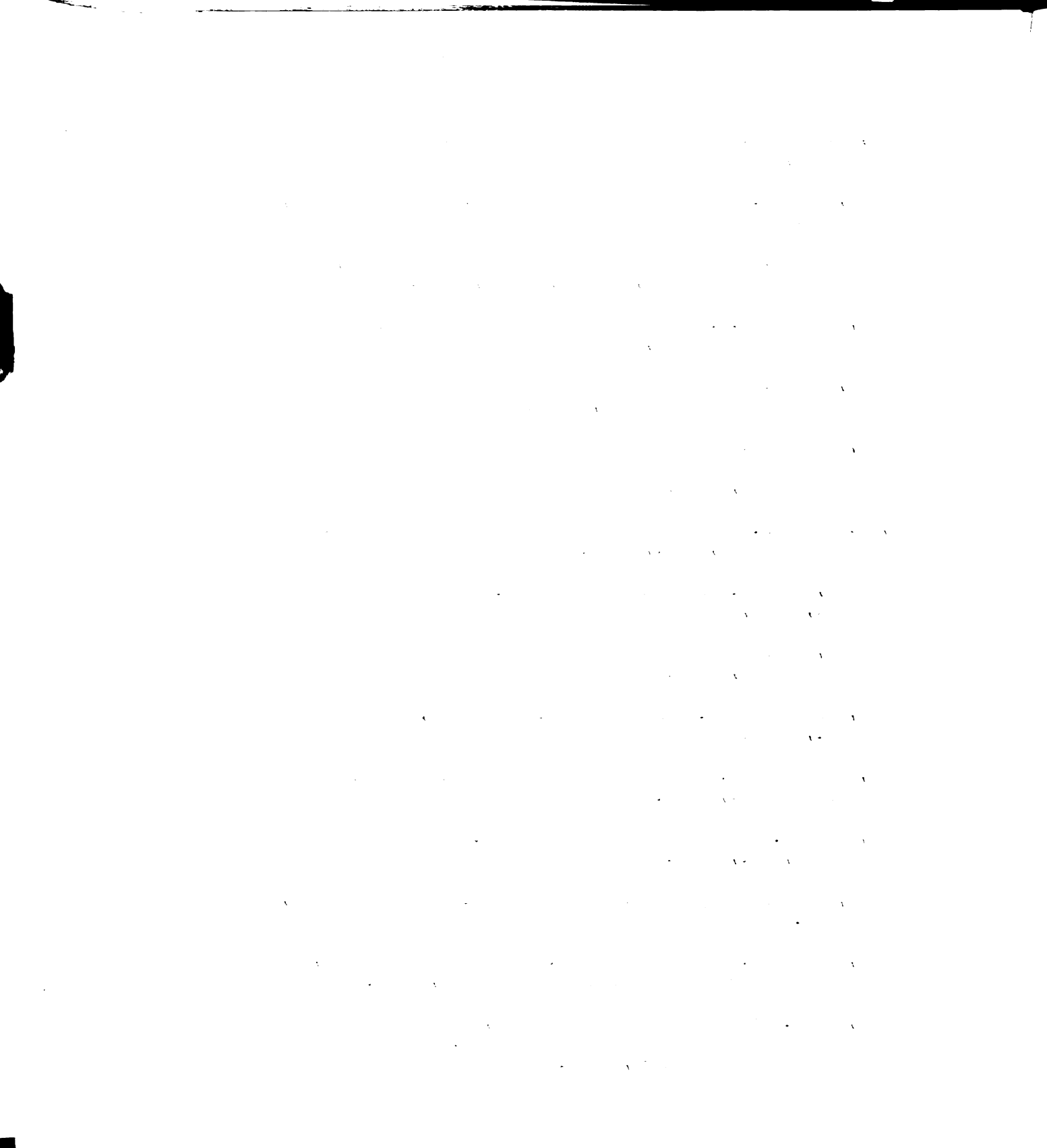
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APPENDIX

LIST OF SURVEYED STATES AND STATE PUBLIC CONSERVATION ORGANIZATIONS

Alabama

Department of Conservation
Water Improvement Commission
Alabama Cooperative Wildlife Research Unit

Arkansas

Arkansas Forestry Commission
Arkansas Game and Fish Commission
Water Pollution Control Commission

Colorado

Colorado Cooperative Fishery Research Unit
Colorado State Forest Service
Colorado Game and Fish Department
State Park and Recreation Board
Colorado Cooperative Wildlife Research Unit

Idaho

Idaho Department of Fish and Game
Idaho State Forestry Department
Idaho Cooperative Wildlife Research Unit

Indiana

Department of Conservation
Stream Pollution Control Board
Indiana Flood Control-Water Resources Commission

Kentucky

Department of Conservation
Department of Fish and Wildlife Resources
Kentucky Water Pollution Control Commission

Louisiana

Louisiana Forestry Commission
State Parks and Recreation Commission
Louisiana Wild Life and Fisheries Commission

Maine

Department of Inland Fisheries and Game
Maine Forest Service
State Park Commission
Baxter State Park Authority
Water Improvement Commission
Water Resources Division
Maine Cooperative Wildlife Research Unit

Massachusetts

Department of Natural Resources
Division of Waterways (Department of Public Works)
Massachusetts Cooperative Wildlife Research Unit

Michigan

Department of Conservation
Michigan Water Resources Commission

Minnesota

Department of Conservation
Water Pollution Control Commission

Mississippi

Mississippi Forestry Commission
Mississippi Game and Fish Commission
State Park Commission

Missouri

State Conservation Commission
Division of Geological Survey and Water
Resources
Missouri State Park Board
Missouri Cooperative Wildlife Research Unit

New Hampshire

Fish and Game Department
New Hampshire Division of Resources Development
Water Pollution Commission
Water Resources Board

New Jersey

New Jersey Department of Conservation and
Economic Development

New York

Conservation Department
New York State Fish and Wildlife Management
Board
New York State Water Pollution Control Board

North Dakota

North Dakota School of Forestry
North Dakota Game and Fish Department

Oklahoma

Department of Wildlife Conservation
Oklahoma Water Resources Board

Pennsylvania

Pennsylvania Game Commission
Pennsylvania Fish Commission
Pennsylvania Department of Forests and Waters
Sanitary Water Board, Department of Health
Pennsylvania Cooperative Wildlife Research
Unit

Tennessee

Department of Conservation
Tennessee Game and Fish Commission
Tennessee Stream Pollution Control Board
Tennessee Division of Water Resources

Vermont

Vermont Fish and Game Commission
Vermont Department of Forests and Parks
Water Conservation Board

Wisconsin

Wisconsin Conservation Department
Committee on Water Pollution
Wisconsin Water Regulatory Board