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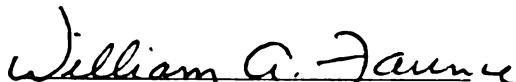
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THE EMERGENCE OF AN OCCUPATION: CLEAN WATER MANAGERS
A CASE STUDY OF THE MICHIGAN DEPARTMENT OF NATURAL
RESOURCES (MDNR) MUNICIPAL FACILITIES GRANTS
SECTION 1965-1991 AND A 1992 SURVEY OF THE
MDNR SURFACE WATER QUALITY DIVISION

By

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ABSTRACT

THE EMERGENCE OF AN OCCUPATION: CLEAN WATER MANAGERS
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RESOURCES (MDNR) MUNICIPAL FACILITIES GRANTS
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MDNR SURFACE WATER QUALITY DIVISION

By

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This dissertation examines the emergence of new positions in the environmental regulation of wastewater treatment, tracing a shift from sanitary engineering to environmental engineering influenced by the partial institutionalization of the environmental movement. The study assesses the current extent of "occupationalness" of these positions.

A tentative causal model indicates the influence of the environmental movement, the founding legislation, and the characteristics of the initial incumbents on the initial position and on the direction of change in the position. It was hypothesized that a build up of occupational support structures and occupational identity would be influenced by the environmental movement.

A three-step, general sequence of events in the emergence of an occupation is studied: 1) emergence of the clean water manager role, 2) initial definitions of the role, and 3) occupationalizing of the role. Data related to eleven hypotheses generating research questions are discussed.

A theoretical review examines what the sources of new jobs are, how social movements affect job creation, and the rise of emerging organizational fields which create new or altered work jurisdictions. Examples of social movement instituted types of work are reviewed. The major focus is upon the conditions and processes for "occupationalizing" the job.

The dissertation studies a sample of water quality environmental managers in the Municipal Facilities Section and Surface Water Quality

Division of the Michigan Department of Natural Resources. Methods of data-gathering included participant observation, an organizational development project, intensive interviews with key informants and a mailed survey questionnaire. The study includes documentary research using journals, work records and public documents.

The study presents findings specifying movement effects, origins effects, organizational field and cohort effects on the attributes of the initial position and on the direction of subsequent change in the position, and on the build up of social structure and group consciousness. The expected causal model is revised in the light of research findings.

Major findings include strong support for a developing, broad occupational identity, but suggest only partial development of an occupational social structure in water quality work. A reciprocally reinforcing model of "occupationalizing" is presented and suggestions regarding applications of findings are made.

DEDICATION

To Marjorie Larmour, the best friend a son ever had.

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CHAPTER 1

EMERGENCE OF AN OCCUPATION AS THE INSTITUTIONALIZATION OF A SOCIAL MOVEMENT: THE CLEAN WATER MANAGERS

INTRODUCTION

The need for clean water and clean air is today universally recognized to be of major importance as the United States enters the twenty-first century. Hundreds of thousands of jobs and occupations are concerned with restoring or maintaining an environment that is free of pollution and toxicity. Clean water managers currently play a pivotal role in this environmental challenge.

Yet in the early 1950's there were very few sanitary engineers employed in the United States. The job of these scattered few, so-called "sanitary" engineers included abatement of both water and air pollution as part of a broad spectrum of civil engineering problems, but the field in which they worked was little known. Indeed, the job field itself at the time was characterized by frustration over this lack of public recognition and rife with internal discussions related to concerns over "professional status."

All of this, however, was to change as the environmental social movement, which began a bare decade later in the 1960's, shaped the burgeoning of a new awareness. From 1963 to 1972 a transition period occurred in the sanitary engineer's job with an increasing shift in the work jurisdiction toward more attention to ecological matters such as water quality and pollution regulation.

By the early 1970's the field had undergone a major change: more and more attention to environmental quality, many new jobs - and a change in the job name: from sanitary engineer to environmental engineer. This period witnessed the start-up of dozens of university degree programs in environmental science, resource development and ecology studies, and saw the passage of federal and state laws mandating clean water and other environmental programs.

Twenty years later, the early 1990's is witnessing over 30,000 university graduates in environmental engineering each year most of whom move into environmental sector jobs. The few "sanitary" engineers of the 1950's had indeed blossomed into the many environmental engineers of the 1990's.

For purposes of the sociology of occupations, one may enquire, regarding this blossoming whether the shift in work jurisdiction has made contemporary clean water management a distinct occupation. More specifically, we ask, what are the elements that characterize the emergence of a new occupation? And to what extent does the emergence of this particular occupation illustrate the institutionalization of a social movement?

Our thesis is that contemporary environmental management emerges as a set of occupations institutionalized by a social movement, i.e. the ecology movement of the late 20th century.

During the 20th century other types of work have emerged through processes or influences of social movements. One may look at the early turn of the century preservationist and resource conservation movements which, resulting, as each did, in small waves of innovation in environmental management work, gave rise to jobs which included a small number of water specialists at the state level. Later in the century other types of work emerged through social movements - jobs in adult education, civil rights, consumerism, feminism, health and safety, labor, mental health, and quality of work life.

This is not to say, of course, that there do not exist many other sources of the emergence of occupations besides social movements. These include new organizations linked to shifts in political-economy, new technology, shifts in private and public demand, new institutions, and general rationalizing societal processes. Much work in occupational

sociology has examined these other sources of new jobs. Yet studies of occupational emergence as the institutionalization of social movements seem underrepresented in the literature.

It is to this underrepresentation that this study speaks. It examines the emergence of a specific occupation - that of the clean water manager - as the institutionalization of a social movement.

This initial chapter presents an overview of the study. The following subtopics will be examined: the general theoretical traditions or strategies drawn upon to guide the work; a brief history of the clean water manager role; an introductory review of the specific theoretical questions addressed in the sociology of occupations; and dimensions of the occupational roles to be studied. Finally, following a brief summation, we review and examine the tentative causal model and present the research questions employed in the study.

THEORETICAL STRATEGIES

What are the various theoretical strategies than can guide a study such as that outlined above? Three of the most relevant theoretical traditions include 1) the institutionalist perspective, 2) organizational ecology, and 3) literature on occupations and professionalization. Other research traditions with relevance to this study include: stratification, social movements, social problems, sociology of science, and environmental sociology. These areas are briefly identified here and discussed in detail in Chapter 2.

Institutionalist Perspective

One sociological tradition that has emphasized origins and emergence of social structure is the institutionalist perspective. This perspective takes a natural history approach to processes of institutionalization by which an organization develops a distinctive character. Typically using case study methods, the perspective emphasizes the influences of individuals, the organizational environment, and often critical or fortuitous events in determining, through historical analysis, the character of institutionalization (Perrow, 1986). In recent years this social constructionist view has emphasized complexes of rules and patterns

in organizational environments that function as binding myths requiring organizational conformity, in an overall context in which environments themselves and specific organizations, and organizations as a form, are becoming increasingly institutional (Scott, 1987).

Within the recent institutionalist literature, however, there has been a tendency for the examination of causes of institutionalization to be eclipsed by the study of its consequences (Zucker, 1987). Survival of an organization is said to link to its isomorphism to an already legitimated (rational) form (Meyer & Rowan, 1977). The institutionalist literature has been weak in research and theory examining the rise of legitimated organizational fields (DiMaggio & Powell, 1983). Social movements have emerged, however, to legitimate new occupations, remake existing occupations, and build up entire new interorganizational fields. A recent example is in the new types of work associated with junk bonds, leverage buyouts, corporate mergers and bankruptcy in the 1980's and early 1990's struggles for control over the corporation. These events have been interpreted as social movements of corporate and wall street financial people and institutional investors by such observers as Fligstein (1992) and Thompson and Davis (1992).

Organizational Ecology

Recent work in organizational ecology (Carroll, 1984) on the birth of organizations is a suggestive research approach which, when integrated with an institutionalist perspective, could provide a research strategy to understand the emergence of jobs stemming from the institutionalization of a social movement. The first generation of ecological models forwarded general processes of founding and survival; there is now a second generation of ecological models (Hannan and Freeman, 1989) that is focusing on specific processes (Miner, 1993; Carroll and Freeman, 1989). A case study of the institutionalization of a social movement in a new occupation could make an addition. If a job undergoes change, when does it become an occupation? What factors may have influenced the shift in work jurisdiction from sanitary engineer to environmental manager?

Occupational and Professionalization Theory

Abbott (1989) defines occupation as work which has had social structure build-up around it and is characterized by a self-conscious social group. Understanding the origins of an occupation therefore requires study of its emerging social structure and the conditions for the group's consciousness of itself as an occupation. In the clean water manager example, our view is that several general external phenomena relate to the development of a distinct occupational structure, situation, and consciousness: a social movement, cohort effects, interorganizational sector interactions, complexity and uncertainty, and growth of knowledge. Internal characteristics of environmental management include a general organizational form, as primarily a public sector bureaucracy, with some emerging, human resource development dilemmas.

Other Theoretical Traditions

Other theoretical strategies can help guide this study. For example the literature on stratification tends to focus on the power of groups or class fractions in the development of professions (Kivinen, 1989) but in a way that neglects the emergence and maintenance of that 'location' (professional middle class, or profession) as a continuing institutionalization of a social movement. If we take the question of the bases and processes of occupational emergence to be not only in the "politics of production" but also in the "politics of movement," our understanding of how occupations emerge could be advanced in examining these social movement cases as "professions in process" (Ross, 1975).

The social movement literature helps us interpret how different types of social movements influence the processes and degrees of institutionalization involved in transforming movement goals into work jurisdictions and labor market positions. Social problems theory locates processes by which issues become defined and are maintained in the public arena and identifies how work jurisdictions form around social problem processes. The sociology of science contributes understanding of how the growth of knowledge occurs and becomes "fields" of study and work, as well as providing studies on the work conditions of scientists, engineers and knowledge workers. Finally, work in environmental sociology provides both

descriptive studies of the environmental movement and some analytical work on the emergence of environmental manager roles.

A STUDY OF THE CLEAN WATER MANAGER ROLE

This dissertation presents an historical analysis of the emergence of an occupational role - clean water managers - as a case study of one type of environmental manager. No work role exists with the job title "Clean Water Manager." The typical job titles in the clean water manager field include: water quality specialist, water quality analyst, environmental engineer, etc. We choose the generic job title clean water manager to indicate in general the specific roles influenced by the 1972 Clean Water Act and the water pollution regulation jobs influenced by the environmental movement. Within water management, one program, wastewater management, is examined in detail. The study includes a report on occupational selection, occupational socialization, and job attitudes presenting data gathered between 1987 and 1992 from documentary research, a field survey, and intensive interviews with Michigan clean water managers.

The focus of the study is upon the conditions that have built-up the social structure and group consciousness of clean water managers. Among the general conditions emphasized are (1) the partial institutionalization of the environmental movement through a "new federal model" (Scott, 1983) involving occupational design as an action plan; (2) the emergence of a legitimated interorganizational field and the complexity and build-up of social structure and group consciousness generated by the interorganizational network in which the clean water managers play a key, linking role; (3) uncertainty resulting, among other things, from complex project management (Strauss, 1988) and from the newness of this role; (4) rapid growth of knowledge and increasing overlaps of ecological interactions (air particulates affecting water, urban and rural runoff, trace toxics) within environment-related work requiring more cross-unit "management" (GAO, 1988); (5) influences on the specific cohorts of persons now in the occupation, eg., the environmental movement, other movements, public pressures, specific historical events, and occupational experiences of the cohort, including mid-life career stage and; (6)

questions of organizational effectiveness and human resource development policies. These general conditions of this role are linked to specific, more proximate processes or potential sequences of occupational development.

The primary task of the study is to examine such intermediate processes in the emergence of environmental management roles and includes a description of 1) the history of decisions to create the clean water manager role, 2) the characteristics of clean water managers, 3) how and why the job has changed since initiation, and 4) evidence on the degree to which this role has become an occupation. We begin by asking: what is the history of this role?

The History of Decisions to Create This Role

The origin in Michigan of the role of water specialist occurred with the passage in 1929 of the Stream Control Commission (PA 245). After WWII the Water Resources Commission amendment of this act expanded water management responsibilities and established a permit issuance system to monitor and control point source discharge to waters. We have chosen to study water management (rather than air, land, or toxics) because, as the first state programs of environmental management, there is some historical point of comparison. The water specialist role began with under 10 positions for the entire state in the 1930's and 1940's. The Water Resources Commission duties expanded to include the handling of federal money for municipal facilities planning in 1957. Activity in water management expanded slowly through the late 1950's and 1960's as growth of urban areas continued. Much further widening of responsibilities, and the expansion of new occupations coincided with the rapid development of environmental thinking and social movements of the late 1960's and early 1970's.

The National Environmental Protection Act (NEPA) of 1969 and the Clean Water Act (PL 92-500) of 1972 were the pivotal legislation which, it may be hypothesized, expanded water management beyond locality and state into a large-scale "societal sector," or mandated network (Aldrich & Whetten, 1981). This legislation mandated a planning process for environmental management of the nation's waters. A complex role for "water

quality analysts" and "project managers" emerged with this act. The Michigan Department of Natural Resources (DNR) went through a major reorganization in 1973 and the Municipal Facilities Planning section of the DNR took its current form by 1976 (Michigan Water Quality Plans, 1981). Many decisions in this planning process have occurred at both the federal level (EPA) and the state level (DNR). The scope of this study is primarily focused on the state level.

The major role of the Municipal Facilities Planning Section in recent decades of water management provides the primary research focus. This section processes federal grant and loan money, with state and local matching funds, and makes environmental impact studies for wastewater treatment plants (WWTP) and sewer drain proposals and projects. What are the characteristics of this role and its incumbents?

The Characteristics of the Role

The nature of the clean water manager's role in this WWTP sector is to act as a "project manager" in the case of grants and loans and to monitor and manage the stages of construction of the plants and the drain projects. As project managers each analyst typically handles 1-7 plant and drain sites or proposals, or both - depending on size and stage in the planning process. Complex rules and regulations from both the EPA and the DNR are interpreted and community assistance is given with regard to water quality standards, grant and loan application paperwork, and project specifications.

The persons who originally entered this role typically had Master's degrees in areas such as biology, urban planning, geography, or chemistry. They may have worked in other public service jobs. Generally in their late thirties and forties, the senior workers, as a first cohort, have received university training in a variety of fields. A younger, second cohort, recently emerging from the new, specific "environmental engineering" and "resource development" programs at the universities have, in recent years, been taking many of the entry level positions. The first cohort entered the water quality role at a time of the initiation of the environmental movement. The second cohort (under 30 in 1992) has emerged

in the context of a continuing environmental movement. What are the specifics of change in the role?

How and Why The Role Has Changed

The first cohort of clean water managers, as senior workers, has engaged in complex interorganizational liaison work with plant superintendents, municipal and city officials, area residents, regional and national EPA officials, occasionally the Army Corps of Engineers, and they have fairly frequent contact with builders, construction companies, Commerce Department analysts, and both state and federal legislators and officials. The emergence of their work as a linking role in this societal sector includes consultation, giving advice and interpretation, leading or testifying at public hearings, making formal reports, and, in general, they have considerable, independent decision-making authority that often involves "grey" areas of interpretation. The emergence of this mandated interorganizational role has created diverse interaction influencing this role. In addition, the incumbents handle an ever larger body of knowledge. Change in the role has partly been based upon uncertainty and uncertainty occurs in part from the newness of environmental manager roles.

Other sources of uncertainty include the emerging nature of the federal programs, and changes in federal level and state level funding, budget policies, urban growth, municipal and state politics, and public pressures. Many, if not most, applicants for grants and loans (by communities) to enlarge or alter plant capacity or build new plants are denied. These frequent denials require an increasing need to defend decisions made. Project managers have many reminders of the complex status of their role which may contribute to "self-investment" (Faunce, 1989), and which require effective management and human resource policies.

Many Environmental Protection Act (EPA) and state Department of Natural Resources (DNR) occupations have emerged as links between municipalities, plant superintendents, builders, residents, voters and others with the enactment of the massive funding and planning process instituted in the comprehensive 1972 Clean Water Act. The subsequent emerging interorganizational field of environmental management, and in particular, the wastewater treatment plants (WWTP) and drains "sector" as

a large dollar program underwent an expansion of legitimacy: there was a place for new roles and new duties for existing roles in the facilities planning section. More generally the sanitary engineers became the environmental managers in an "origins effect" shift in the work jurisdiction. The clean water manager role arose, then, in a specific historical context and the intent of this study is to examine these circumstances for the WWTP case. Does environmental management become a profession in the transition of work jurisdiction from the 1950's to the 1990's?

Evidence that the Role has Now Become a Profession

From the description above, it can be seen that the clean water managers' role has many attributes associated with the professions. There are many processes influencing the character of recent occupations and professionalization is one type. However, Kivinen (1989) has noted that when an analysis of power resources is done, it is clear that "there does not exist a single, universal process of professionalization." Professionalization must be seen in relation to other processes which are conducive to the emergence of occupations. He notes that this is the only way to produce usable conceptualizations of the various forms of mental work.

One of the important concerns in the study of professionalization is the conditions producing autonomy. If occupational autonomy can be briefly defined as being able (and having the right) to make independent decisions as a part of the job, we would argue that the occupational role of clean water manager has a considerable amount of a specific type of autonomy. Kivinen (1989, 64) notes that, in looking at the overall class structure (labor process), different types of autonomy occur. Behind each type of autonomy we should examine the specific (sometimes intersecting) processes. Where autonomy exists, it is likely to be vested in specific occupations and, therefore, evidence of autonomy bears on the issue of occupational emergence.

Our study examines the evidence that this role has become an occupation by substantiating the initiation and changes in this role as an example of a location in one type of managerial hierarchy (public

environmental organizations) and a type of scientific-technical profession (environmental managers). The specific focus on build-up of social structure and group consciousness we present is needed in order to go beyond the conventional generalization that these types of work become occupations through abstract steps or lock-step sequences of "professionalization." Abbott (1990) has noted the importance of studying sequences of professionalization events more closely. And, as Kivinen notes of developed professions, "the position of these qualitatively different types of autonomy in the class structure cannot be determined ahistorically, without paying due attention to the development of the underlying processes." (Kivinen, 1989, 64). In summary, the conditions we believe may influence these processes in the case of the environmental manager include: interorganizational complexity, the growth of knowledge, the uncertainty of newness and other uncertainties, the massive environmental movement and other public pressures, and the occupational experiences of a specific occupational cohort with emerging career and organizational concerns. How do these considerations relate to theoretical issues in the sociology of occupations?

AN INTRODUCTORY REVIEW OF RELEVANT THEORETICAL ISSUES IN THE SOCIOLOGY OF OCCUPATIONS

The observation that occupations emerge through the institutionalization of social movements has been made often (Weber, 1946, 1947; Hughes, 1958; Abbott, 1988). However, this process has been given limited systematic research attention. In recent decades, many new social movements have created conditions for the emergence of diverse new occupations. There are, however, few studies which explore this theme. Recent treatments include analysis of the urban advocate planner (Ross, 1975), occupational program consultants (Blum, et al, 1988), and health care occupations (Bucher, 1988). From even these few studies, we can observe that, among the many sources of new work roles, social movements have played their part.

As a field, industrial sociology has, of course, a long history of general studies of the emergence of occupations. The model of labor process rationalization as an instrumental process has often led to a view that emerging occupations or class fractions are deskilled or reduced in

occupational autonomy (Braverman, 1974; Edwards, 1979). However, this approach typically does not examine other processes that may enhance autonomy. Some occupations are not shaped directly by the control structures of the capitalist labor process studied by neo-Marxists or by the instrumental, rational-legal forms studied by neo-Weberians. As a parallel development to these general labor and bureaucratic processes in contemporary society, there are other, separate, structural questions about how social movement occupations emerge. For example, it could be argued that there are substantive rationality processes occurring (Habermas, 1990) where roles directed toward ends (ecological coherence) are partially institutionalized in new occupations. A type of critical theory of new occupations is needed. The environmental movement, and its partial institutionalization in new occupations, may suggest an open-natural perspective (Scott, 1987) on other dimensions than capital logic or rational legal phenomena as operating in social movement institutionalized sets of occupations. What does the social movement want by way of occupations?

So far, the environmental movement has encouraged roles to develop as careers in environmental management. The duties may seem rather conventional. The new or revised roles are in the mold of familiar "hats" such as "regulator" or "planner" or "project manager," and "analyst" or "specialist." Yet these "hats" are not only common bureaucratic job categories but may be unique combinations of duties influenced, in terms of their content and organizational culture, by the environmental movement and by cohort, knowledge and sector phenomena in ways that suggest the emergence of new occupations. How can we specify the processes of such occupational emergence? One important dimension of occupations is their relation to "careers": the existence of career paths is one aspect of the structure through which occupations are defined.

The Need to Specify Processes in the Emergence of Occupational Careers

In the continuing transformation of societies with developed economies, the emphases on growth, mechanization and size have been augmented with the growing concern for the environment. In this respect "industrial sociology" appears to have unalterably become "industrial-

environmental sociology." Changes in the patterns of division of labor, bases of social stratification, and mechanisms of social integration seem immanent in the ecologically coherent thrust of the continuing environmental movement - or at least the issues are being raised anew in the 1990's. One insight from our study is that a career path for environmental managers - however much pushed for by the earlier phases of the environmental movement - seems complex and problematic. The degree of "occupationalization" for the incumbents has come to focus, in part, on the question: "Is this a career?" This is a first cohort question which may insert itself in the recently stepped up environmental consciousness. The public pressure will probably be there for the 30 and 40 year old cohort to push along in the emerging environmental occupations as a career. But this remains problematic at the moment. Applied work in organizational development and human resource development conducted prior to this dissertation suggest that there can be improvements in organizational capability if the specific processes of occupational emergence are clearly understood.

Marx, Weber and Durkheim did not wrestle closely with the concept of an occupational career. For Marx the labor process was, as mentioned, an abstract phenomenon primarily determined in the dawning epoch of his day by capital logic. For Weber the general process of bureaucratization suggested a limited set of specific authority processes - such as the routinization of charisma - leading to the institutionalization of staff structures (See Abbott, 1989 on the staffing process). But beyond this general process, little specific attention is given by Weber to the emergence of occupational careers through social movements - the primary emphasis generalizing as either a "rational-legal" or a traditional pattern of the general form any such careers might take. For Durkheim the organic solidarities of interdependence in the division of labor were functional at the social system level and, with some exception in his study of education, his argument tended to stay at a collective (or normative) level rather than analyzing specific processes of occupations.

While recent neo-Marxist organizational and neo-Weberian institutional studies have emphasized the labor process and rational myths, certain writers, as mentioned, have noted a need to examine

specific processes in the social bases of the labor process (Kivinen, 1989) and specific processes in the build up of social structure and group consciousness characteristic of the institutionalization of occupations (Abbott, 1989). Studies such as Ross (1975), Blum (1988), and Bucher (1988), as mentioned, have tried to examine such specific processes of social movement institutionalized occupations. In any such study how can it be ascertained when any job as become an occupation?

What is an Occupation?

For work to become an occupation general processes and specific processes must contribute to the build-up (and maintenance) of social structure and group consciousness. This conclusion is emphasized by Andrew Abbott (1989), who asks "What exactly is required for us to call a group of workers 'an occupation'?" He argues that: "occupation" signifies a conscious social group, whereas "type of work" or "job" signifies a common work that may or may not give rise to an occupation. A category of workers is not an occupation. To be a social group made up of people who do the same kind of work members must be in social and cultural interaction. In this sense "occupationalness" results from social and cultural structuring of merely implicit links. Abbott defines "social structure" as routine patterns of behavior, and "culture" refers to patterns and symbols giving meaning to social structure. Abbott notes (1989, 1990) that there is no general analysis of the different types of occupational coalescence and the conditions, particularly the biographical and career conditions, under which various types of occupations emergence or are possible. What dimensions of occupational roles should be studied to examine biographical and career conditions, and broader societal contexts of occupational coalescence?

DIMENSIONS OF OCCUPATIONAL ROLES TO BE STUDIED

As general conditions influencing the emergence of the environmental management role, the social movement, new federal model, interorganizational field, growth of knowledge, complexity and uncertainty, and cohort experiences all interact with several basic dimensions of occupations. The dimensions of occupational roles to be studied that are elements of social structure and group consciousness

include: authority structure, occupational socialization and training, career patterns, occupational support structures, and occupational identity. We briefly review each of these occupational dimensions and then present a general model depicting the relationships among the elements of our study.

Authority Structure

We have observed that analyzing qualitatively different kinds of autonomy requires attention to the underlying processes (Kivinen, 1989). We have noted that the literature on professionalization tends to focus on the bases of power of groups (or class fractions) in a way that neglects the emergence and maintenance of that location. In the case of the institutionalization of the environmental social movement, the endeavors of the "profession" of environmental managers was not there since a large number of positions had not yet been institutionalized. We noted the early concern with "professionalization" and recognition felt by the few U.S. sanitary engineers in the early 1950's. The problem of the collective action of the social group - for example, environmental managers - becoming a profession is a process. This process is tied up with and emerges in part from the broader specific processes of the partial institutionalization of the social movement. The one-dimensional view of professionalization as a labor market "power" phenomenon, however, misses this broader societal context dimension to authority structure, and is a weakness in the literature.

The authority structure of environmental management is similar in some ways to other public sector jobs but also different in some ways. As a civil service role located in a bureaucratic hierarchy, public sector environmental managers work within a typical state job organizational setting. There are position specifications, job and promotion qualifications, and a job ladder based primarily on seniority. Many environmental jobs are specific regulatory, monitoring, guidance, permit issuance, enforcement or paperwork roles having seemingly little further mobility. Unit chiefs, section heads, division and department leaders contribute a thin management component. There are job descriptions and the legislation initiating these positions often involves mandated role

behavior. Training to some extent involves a certain kind of formalization of the regulatory work processes (Mintzberg, 1983).

Like many state jobs, water quality roles are civil service positions established under a public act and the authority structure is similar, in some ways, to other state workers. On the other hand, unlike a lot of civil service roles, the role of environmental manager is a position implicated with 1) social movement pressures, 2) emergence of a legitimated interorganizational field, 3) distinct cohorts, and 4) rapid growth of knowledge connected to an historical paradigm shift (Olsen & Dunlap, 1988) in industrial society. The substance of this paradigm shift, documented by Olsen and Dunlap, involves a recent change in American beliefs from the preexisting technological worldview to an emerging ecological worldview. Influenced by a social movement, structured by an emerging interorganizational network, carried by a cohort, in the context of rapid growth of knowledge and shift in societal paradigm, the role expectations of this position are institutionalized representations of that social movement.

Under public pressure, given sector expectations, and in the context of rapid growth of knowledge this cohort can exercise some degree, or specific type, of autonomy. The authority structure, then, in addition to "bureaucratic" and "professional" tensions, is characterized by a specific type of shared power: the environmental regulators are backed up within the state hierarchy by movement, cohort, sector and knowledge processes. Our study examines the development of these specific underlying processes in the emerging authority structure of this role.

Career Stage and other Influences

Many environmental managers are located at the higher specialist grades in the various state civil services (if Michigan data are indicative of the national trend). Organizational field interests demand competence and therefore may lead to more senior workers. The demands of the environmental movement may create a push for more experienced upper-level specialists. In any case there are currently approximately 30% of all Surface Water Specialists in the top non-management civil service level. This may, in part, be a function of rapidly growing knowledge and

uncertainties. There may also be a cohort effect of generationally aware incumbents interested in expanding the number of senior level positions available to them. With limited mobility into top management positions, however, the senior workers may develop the problematic of how to deal with intrapositional mobility ceilings at their mid-life career stage.

Typically taking three years to "get up to speed," in the case of the Community Assistance grants and loan workers, such specialists over time can develop more knowledge than most of their superiors. They can find existing DNR human resource management policies insufficient for their individual development. Yet movement, sector, and cohort influences may be pushing for better policies. These, and other 'local knowledge', cohort experiences - and more generally, perhaps, the quality of work life movement - may also encourage this cohort's wish to make more meaningful decisions, i.e., to achieve and maintain occupational autonomy. Based on an earlier organizational development intervention, it may be argued that it is within the organizational capability of the natural resource departments as a whole to improve on their strengths through increased efforts to innovate in personnel policies.

Occupational Socialization and Training

Rapid growth in the last fifteen years of university-based training programs (Disinger and Schoenfeld, 1987) and the experiences in "institutionalizing" of the first cohort in the context of the application of a federal model has set the parameters for socialization in the emerging role for both the first cohort and a second cohort. The first cohort hiring in during the mid-1970's or early 1980's had diverse backgrounds - degrees such as geography, urban planning, or biology. However the first cohort participated in shifting the environmental regulator role from a tendency toward "engineering" perspectives to a tendency toward "environmental" perspectives. The transition from diverse backgrounds to a common "label" or group consciousness is one characteristic indicating the emergence of an occupation (Blum, et al, 1988).

This shift from an engineering to an environmental perspective was simultaneously being reflected in the start-up and development of specific

university-based programs in resource development, environmental planning, and ecology studies from which the second cohort has tended to be recruited. Such a build-up of social structure in more specific environmental training reflects one underlying process in the emergence of an occupation. On-the-job training by the senior workers also involves elements of group consciousness since it is the first cohort that links strongly to the design of the university programs. The study examines more closely such links between social movement, sector, cohort and growth of knowledge and the emerging processes of occupational socialization and training.

Career Patterns

It would appear that environmental management roles are increasingly "fixed" and specific. That is, enough social structure has built-up (institutionalized positions, programs, specific training) and enough group consciousness has emerged (consensus on common labels and perspectives) to establish not only jobs in organizational hierarchies (eg., civil service jobs in "environmental work"), but also the potential for intraoccupational "careers." Some of the preliminary interviews indicate a degree of recognition in the "field" of environmental management and a tendency for the environmental semi-professional "hat" of "specialist" or "project manager" to become an effort at and desire to establish a more professional career pattern, i.e., gaining recognition in one's field.

Initiated as "regulator" and civil service specialist jobs as part of a social movement inspired new federal model action plan, these roles with mandated job descriptions in bureaucratic hierarchies have become - as the cohort matured, as the environmental movement continued, as the sector grew, and as knowledge exploded - more and more fixed and focused on environmental management as a career path. The study examines some of the underlying processes influencing the career path of the environmental manager.

Emergence of Occupational Support Structures

One phenomenon signaling the rise of an occupation is the emergence of support structures such as occupational associations, journals and

publications, credentialing authority, and other steps in "professionalization" (Ritzer, 1986). These structures both encourage and are products of (and evidence of) group consciousness. In this study water quality associations, journals and publications are examined. The timing of their emergence is noted and their content is documented to substantiate links to the general conditions influencing environment management (social movement, sector, cohort and growth of knowledge). The emergence of types of credentialing authority (eg., university programs, agency or association training programs) is documented. Interviews with water quality workers, and a general survey questionnaire examines the build-up of social structure and group consciousness over the last 15 to 20 years especially in terms of their relationships with these emerging occupational support structures.

Emergence of Occupational Identity

Blum and others (1988) have argued that one measure of when you have an occupation is that, at the point of the emergence of an occupation, a common way of thinking has occurred. Persons with diverse backgrounds now think and act with a degree of measurable consensus about their work role. Occupational ideologies, orientations, work attitudes and self investment (Faunce, 1989) all take place as a socially constructed set of variables in the emergence of an occupation.

This study explores the rise of group consciousness in the sense of the emergence of a distinct identity related to this occupation, and substantiates the points of interaction with social movement, interorganizational field, complexity and uncertainty, cohort and growth of knowledge as general conditions related to increasing consensus regarding identity. In brief, these five dimensions of the occupational role - authority structure, socialization and training, career patterns, support structures and identity - are shaped by their specific content, that is, by the general contextual variables of environmental management: social movement, interorganizational field, uncertainty and complexity, expanding body of knowledge, and experiences of the specific cohort(s) of role incumbents in their newly created occupation.

We have, then, a natural history: an Act (Clean Water Act, 1972) which creates its own process (mandated planning and standards) which then institutionalizes an occupational role into which a cohort is selected, who, as incumbents, negotiate about that role. We are documenting the history of an occupation. This dissertation forwards only a tentative causal model. The mutual interactions and influences we describe are carefully adumbrated and we examine these causal influences with a history and relevant documentation, with intensive interviews, and a general attitude survey. It is in the nature of this type of case study that we will attempt to generate hypotheses through our answers to the research questions.

SUMMARY

This is a study, then, of the emergence of an occupation as an instance of the institutionalization of a social movement. By institutionalization of a social movement we mean the development of formalized, legitimated roles and organizations designed to achieve movement goals. By emergence of an occupation we mean the development of social structure and group consciousness around a labor market position. ("Occupations" is a more inclusive term than "job:" water quality management is an occupation; management of specific water quality programs for the Michigan Department of Natural Resources is a job.)

THE TENTATIVE CAUSAL MODEL

The emergence of the clean water manager role is conceptualized as a sequence of events beginning in recent history with the rise of the environmental movement and subsequent partial institutionalization of its goals into legislation, positions, and organizations. The second phase in such a sequence is characterized by initial definitions of the clean water manager as a social role, including characteristics and attributes of initial incumbents, initial interactions, early conflicts, issues and problems that set the occupational and organizational "origins effect" into some stable pattern. The third phase (to which major emphasis is given) is conceptualized in terms of a process of occupationalizing in which various pressures for greater autonomy, careers, training and support structures, and the development of a shared occupational identity

emerges. The development of clean water management as an occupation, as conceptualized, is examined primarily through a case study of one DNR water quality program, the Wastewater Treatment Plan (WWTP) grants/loan unit, and a general attitudinal survey questionnaire of mid-Michigan surface water workers. A general sequence of events is presented to summarize the nature of the study.

General Sequence of Events to be Studied

Phase One: Emergence of Clean Water Manager Role

- environmental movement exerts pressure on federal and state governments to improve water quality.
- legislation establishes water quality program.
- clean water manager position is developed (or expanded and altered) in Department of Natural Resources.
- developing of organizational network involving clean water managers.

Phase Two: Initial Definitions of the Clean Water Manager Role

- structural characteristics of the role.
- location in authority structure, internally.
- attributes of initial role incumbents.
- job history of initial role incumbents.
- interplay of individual and organizational influences on initial role definition.
- early conflicts, issues, problems.

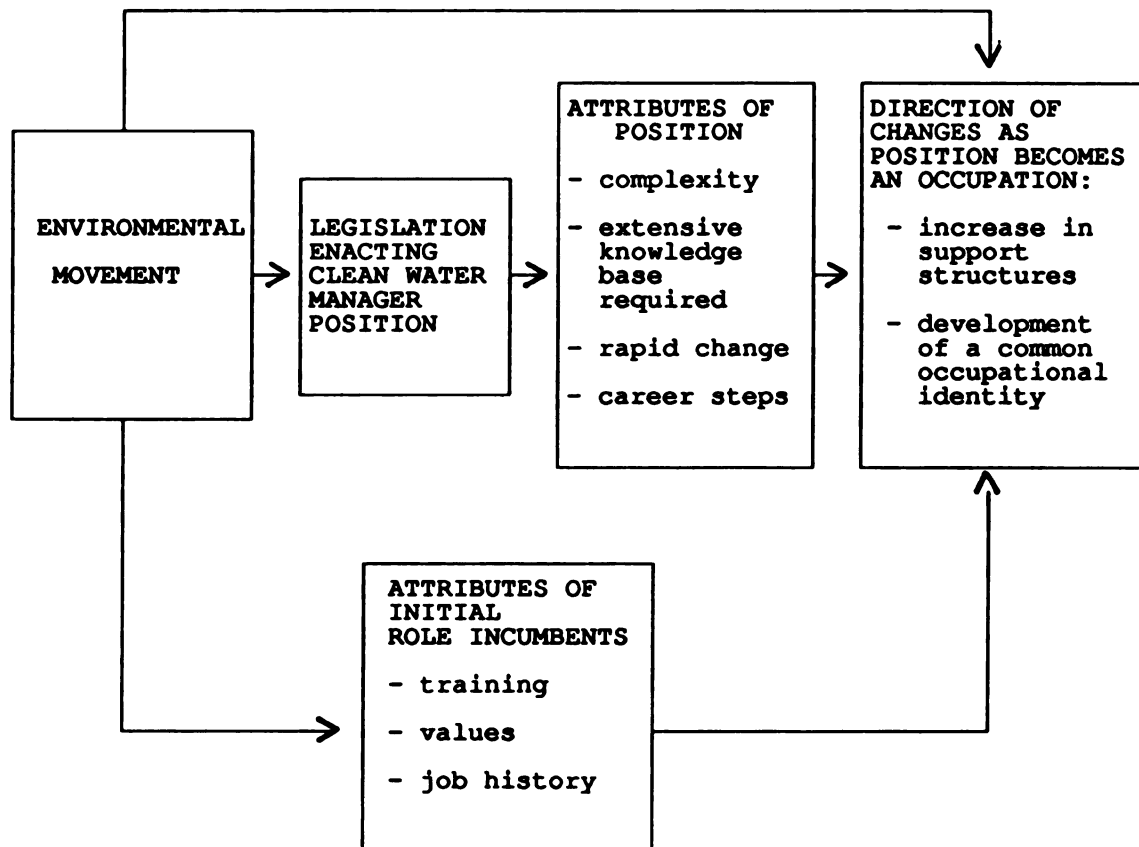
Phase Three: Occupationalizing the Clean Water Manager Role

- pressures for greater autonomy
- emergence of more standardized career patterns.
- emergence of training programs.
- emergence of additional support structures (professional organizations: journals, credentialing - or moves in that direction).
- development of shared occupational identity and ethos.

The relationships indicated as sequences of occupational emergence are diagrammed in an "expected causal model" presented as Figure 1.

The overall objective of the study is to describe the events from development of the clean water manager role to present characteristics of

Figure 1. EXPECTED CAUSAL MODEL



the role in order to develop hypotheses explaining these events. In order to do this, eleven research questions were developed, which will be described shortly. However, as we have indicated, there are theoretical arguments underlying the set of variables selected for study. These are discussed in Chapter 2. It is useful here to identify some of the hypotheses suggested by the tentative causal model.

Examples of Expected Findings

1. The environmental movement played a significant role in obtaining passage of legislation setting up the clean water manager role.
2. The initial cohort of clean water managers had a strong identification with the environmental movement which influenced their performance of the role.
3. Perception of complexity and uncertainty will pressure for professionalization of the clean water manager role (increased autonomy, formal training and certification, standardized career patterns, use of professional labels).
4. More recent entrants into this role will have a clearer occupational identity and a more developed and commonly shared occupational ethos than characterized the initial incumbents. (Note: those who initially entered role and stayed in it should experience change in the direction of clear and shared identity).
5. There will be continuing influence of the environmental movement on emerging environmental management training programs and certificate procedures.
6. Direct influence of the environmental movement will vary inversely with level of institutionalization of various aspects of the role.

Eleven Research Questions

The case study described in Chapters 3 and 4 of this dissertation is an effort in the "natural history" style of institutionalist studies (Perrow, 1986). It is in the nature of this type of case study that we will attempt to generate hypotheses through our answers to the research questions. To aid us in this endeavor eleven research questions and tentative answers from the study are presented in section four of Chapter 3. Chapter 4 will present conclusions and implications of the study. The eleven research questions are:

- 1) How did the environmental movement influence the emergence of the position? (movement effect, institutionalization effect)
- 2) How did the environmental movement influence characteristics of initial incumbents? (movement effect, cohort effect, origins effect)
- 3) Did the emergence of the position and characteristics of the initial incumbents affect the environmental movement? (interactive effect)

- 4) How did the initial definition of the position affect subsequent developments of it? (origins effect)
- 5) How did the characteristics of the initial role incumbents affect subsequent development of the role? (cohort effect)
- 6) Were there continuing influences of the environmental movement on subsequent development of the position? (continuing movement effect)
- 7) What structural supports for the position have developed? (occupational emergence)
- 8) Has a consciousness of occupational identity emerged? (occupational emergence)
- 9) If there is a "second cohort" how does it relate to the occupationalizing process? (cohort effects)
- 10) How has the environmental movement affected the increasing complexity of the position? (growth of knowledge, rules, organizational field, changing problems)
- 11) To what extent has the position developed the characteristics of Wilensky's (1964) "new mixed professional" or "program professional?" (program professional effect)

This is an exploratory study, a "natural history" case study. We have conducted a series of interviews with all members of one unit (East Grants WWTP Community Assistance project managers), over a four year period (1987-1990). There are two units of project managers (east side of state, west side of state) and a technical support unit (financial and engineering) in the Community Assistance section of the Surface Water Division. These units together total 22 people and are the primary focus of the study. Each state has a more or less identical program since the positions were, in part, created and standards established by EPA planning directives after 1972. Each state also had a similar growth of the WWTP societal sector. Therefore the study of the emergence of Michigan WWTP Grants and Loans program occupations and its sector should provide a case study that could be replicated in and may be representative of all states. Our sample and natural history should tell much of the story of "occupational emergence" in all fifty states (and reflect patterns capable of comparative study in world urbanization and environmental management trends). We have also interviewed some persons in the water quality division whose positions are located outside the Community Assistance Section and we have data from a mailed survey of the entire mid-Michigan based Surface Water Division water quality workers. We are able to present similarities and difference for clean water management generally in the

state. Some brief considerations are given to factors that might make the Michigan case unique, and factors that might make our case study generalizable.

As an historical analysis of the emergence of an occupation, the study also employs documentary methods. Relevant documents at the state and federal levels were researched. Industry and trade magazines and professional association publications were studied. Several individuals in the occupations studied were interviewed again after careful construction of a pre-test research interview schedule.

The kinds of data collected include an understanding of the creation of the occupation from the perspective of the role incumbents, substantiated through relevant evidence such as documents, letters, EPA internal nonbinding memoranda or delegations, memoirs and books. Other state level DNR documents, letters, internal memos, memoirs, and books on the DNR were also studied.

A partial history of each unit of the "societal sector" is also constructed from relevant trade and industry publications, the interviews, memos, and legal rulings. There is documentation of a few critical incidents and representative cases of relations between project managers and municipalities that are in trouble with pollution problems, and between project managers and private industry consultants to illuminate organizational field patterns.

Professional association newsletters and publications, university curricula, aspects of resource management as a field, and other occupational documentation were researched. Personnel records along with the 7-page mailed survey were useful to document some of the generational cohort questions. News files from various sources were consulted along with observations of lobby group activities in the environmental and economic development areas.

Why These Methods?

A substantial case study has been produced by these methods. For the purpose of an exploratory study that is hypothesis generating, these seemed to be the relevant methods. Four years of periodic interviews were conducted and every member in the unit had been interviewed at least once.

Moreover, plentiful qualitative and documentary data sources were available since almost all decision making in the state DNR and the federal EPA is public knowledge.

The limitations of these methods are that they are useful for uncovering relationships and developing and refining hypotheses. They are not precise enough for testing the hypotheses raised. Abraham Kaplan has made the distinction between the "context of discovery" and the "context of presentation" (Kaplan, 1964). The "natural history," or case study approach is a "context of discovery" approach - we describe the relevant details of what we think is there. Severyn Bruyn has defended qualitative methods in a classic book on methodology. Herbert Blumer noted in the "Preface" to Bruyn's (1966) book:

(Diversity in the conceptions of scientific method) . . . is obscured by the tendency at one or another period of time for a particular conception to acquire prestige and relative dominance - as in the case of the current identification of scientific procedure with "research design" cast in the form of a relationship between independent and dependent variables under conditions of a control group (Bruyn, 1966, v).

We hope this study has remained focused on answering sociological questions, and also helps to solve problems "that are important to people outside the discipline and that affect the quality of life in society" (Olsen, 1981).

CHAPTER 2

HOW SOCIAL MOVEMENTS CREATE JOBS AND AFFECT THE CONDITIONS FOR OCCUPATIONALIZING THEM Toward Understanding the Emergence of the Clean Water Manager Role

End products of broad social movements of social reform, these (persons) combine professional standards of work with programmatic sense and constitute an important link between professional culture and civic culture, the (person) of knowledge and the (person) of power. (H.Wilensky, "The Professionalization of Everyone?" AJS, 1964, 158).

INTRODUCTION

The 1960s sparked many new social movements, brought new attention to organizational forms, and stimulated new knowledge. It was a period which initiated the "ecological" perspective. One of the early commentators, Harold Wilensky, noted the potential importance of the "occasional rise of social movements spawning new occupational groups and missionary orientations" (Wilensky, 1964). This was also a time of widespread discussion of professionalization. In the midst of much social turbulence social movement institutionalized occupations contributed to the emergence of "the program professional." This is the role orientation of a person who is a specialist in depth with professional competence but who also has a strong commitment to particular social movement originated programs, policies and goals. These programs often involved the program professional in organizational dynamics and forms of control along with

social movement dynamics and professionalization. This phenomenon, Wilensky argued, was worth further attention.

More than twenty-five years later these insights still seem worth further study. Many new social movements have, over the ensuing three decades, spawned new occupations. Concern for the environment, for example, has been carried by one of these new movements, spreading ecological consciousness, building elements of social liberation, cultural and reform movements, and creating many new jobs. Many environmental jobs have both movement and professional orientations, as well as organizational dimensions and this is especially true for "program professional" senior workers. Wilensky noted that these new forms of program professional occupations had incumbents with role orientations which reflected -in the clash between the requirements of profession, organization, and social movement - new mixed forms of resolution. This new mixed form was not purely professional control, purely organizational control, or pure social movement control but a new blend of controls reflecting an emergent role orientation or "resolution" (Wilensky, 1964, 155-158). How have the processes that give rise to this new mixed form shaped the emerging occupations of the environmental managers?

This study is an examination of a small sample of environmental managers who represent such new, mixed forms of occupation. As we tell the story of one unit of water quality specialist roles in Michigan's Department of Natural Resources we hope to contribute to the study of the emergence of occupations. To do this we need to note the difference between a job and an occupation. How do environmental movement jobs become occupations? We need to examine how social movements, organizational, and occupational processes affect the emergence of a new occupation.

Unique Forms, Instituted Jobs, Movement Controls

Located in new and different organizational forms than the "old professions," emerging as an occupational structure of "mixed types" of organizational controls, professional controls, and social movement

controls, these newly emerging environmental manager roles underwent (and are undergoing) transformations from "jobs" into "occupations" (Abbott, 1989). Our case study traces the history of this story for one environmental unit: the Michigan wastewater treatment plant (WWTP) Grants and Facility Planning Section of the Surface Water Division, Department of Natural Resources. To have a role as a "program professional" occupations and organizations must persist, and there must also be some kind of "career" over time in such roles. Yet social movements may vary in intensity over time. Some instituted roles may be "jobs" and not "occupations." How can a "career" be made - how do you "make a life" in environmental management?

Many incumbents in the work unit studied here have an interest in making environmental work a career. Yet many environmental roles began new: new jobs in newly formed organizations. There were not always clear "occupational career" steps built in. To become a profession a job must have at least some career steps. Where will the senior workers in environmental management go, how will they (continue) to become "program professionals"?

Clearly environmental work is a social movement influenced set of roles. As many publications in environmental fields reflect, "careers" in this field are uniformly described in ways that suggest their social movement or missionary dimension. One such publication notes:

For those with college and post-graduate degrees, the wastewater industry offers the adventure of finding ways to anticipate and solve problems that threaten the very existence of man on this planet [Water Pollution Control Federation (WPCF) bulletin, #150, 181].

Of course, environmental and other social movement influenced jobs are only one type of recently emerged work. The changing forms of occupation and organizations have many sources. In examining the sources and processes of new, emerging jobs, we may learn something about the situation the environmental management jobs are in. In general, how are new jobs created? How do new occupations emerge? How do social movement

institutionalized jobs and occupations differ in their emergence from the emergence of other types of work?

PART ONE: SOURCES OF NEW JOBS AND OCCUPATIONS
AND THE PROCESSES OF THEIR EMERGENCE

The sources creating new jobs and occupations are several and diverse. Origins may be linked to the rise of new technical and knowledge developments¹, new organizations, social movements, shifts in consumer and public demand, new social institutions, and general societal and cultural processes. Historically, of course, the shift from craft occupations to industrial organizations was accompanied by massive transformations in work organization. The work activity of the industrial social order was removed from the home and involved new social controls at factories, workshops, stores and offices. Along with new social relations, came tendencies in industrial (or "organizational") society for rapid developments in technical and knowledge spheres, a trend which continues. However, this was not a trend that proceeded without some reaction.

Societal reaction to the industrial revolution, in the form of social problem consciousness², social movement formation³, and other societal processes⁴, have brought forth social movement instituted types of work. As part of these waves of societal reaction, many of today's older social movements - human rights, labor, welfare - established conditions for new goal-oriented roles, mediating roles, ancillary roles, and counter-roles in voluntary organizations, unions, business and government. Many of the new social movements of the last three decades - adult education, civil rights, consumerism, ecology, feminism, health and safety, mental health, and peace⁵ - have also institutionalized new jobs. These new roles have taken their place alongside the many other new jobs created by a changing political economy.

As small holdings 19th century capitalism shifted to big ticket-item 20th century consumer capitalism⁶, market dynamics began to create waves of new jobs as supply and demand shifted. Changes in degree of market

freedom brought forth rural and urban movements, and government entered its first massive regulatory phase in the period 1890 to 1940 with anti-trust, conservation and labor legislation. The rise of the nation-state, partly as an infrastructure of social expense, partly as a response to old and new social movements, and partly as an autonomous staffing structure with its own interests, set agendas in which myriad public sector jobs' have emerged. Finally, many new (or greatly expanded) institutions which overlap in their genesis with political economy, government, and social movements have emerged. These include education, public administration and public health which, as new institutions in the 19th and 20th century, became part of the changing social order, creating new jobs and occupations.

There are even deeper types of "institutions" that are ways of creating social solutions (such as work activity) through taken-for-granted processes. An example would be the tendency in many societies today to act in terms of what Weber studied as "modern western rationality." Such general societal processes as solving problems through experts are a part of this trend. We will examine each of the sources of new occupations identified above briefly.

New Knowledge Leading to Subspecialties

The history of the role of knowledge workers indicates that the bases in the social structure for specialized knowledge roles was limited prior to the rise of industrial society (Berger & Luckmann, 1967, 81). In his comparative history of the emergence of "Western rationalism", Weber noted that the "economic culture" (Berger, 1986) of capitalism included an increasing emphasis on the types of functional rationalization (Mannheim, 1940) where expert knowledge becomes a base of power. Bureaucracy, for Weber, is ultimately premised on knowledge (Wright, 1975; Abrahamsson, 1977). New specialty units in organizations, new specialty roles that may become occupations, and a new specialty authority for such knowledge-based types of work spreads as knowledge increases. Of course the initiation of

these new knowledge-based types of work means that the initial cadre of new role incumbents are going through a process of role emergence.

As the division of labor increases, subuniverses of knowledge are institutionalized. These subuniverses of knowledge can become positions in a labor market as the new knowledge is "carried" by individuals and groups acting out the emerging specialty roles (Berger & Luckmann, 1967, 67-87). The knowledge and its social base interact in a way that is commonly understood as the "growth of knowledge and new specialties." That is, the subuniverse of knowledge often may lead by various processes to subspecialties and create new roles. We need to examine more closely how these processes work.

Bucher and Strauss (1961) described how, in the "profession in process," a new subspecialty engaged in concerted activity within some larger established "general" profession (such as medicine) to change the nature of knowledge work as they articulated their new subspecialty. Intellectual and specialist movements occur within many broad work categories. The "segments" (or emerging subspecialties) within the broad work categories often have, as Bucher and Strauss note, divergent values and may, through conflict processes, carve out a new occupation around differences in the sense of mission, characteristic work activities, methodology and techniques, clients, collegueship, interests and associations, and relations to lay public." As a broad work category, natural resources and conservation has undergone a similar set of processes.

The growth of an environmental perspective in recent decades has led to making many existing planning and regulation roles into "professions in process" as the new values filtered into federal and state civil service resource development jobs. Along with the growth of environmental knowledge, there has also been the emergence of many new subspecialty roles. Of course, these "professions in process" dynamics have most often occurred in organizational contexts - and often in new organizations.

New Organizations

The emergence of special purpose organizations as a major building block of society rests on general social factors such as widespread literacy and specialized advanced schooling, urbanization, a money economy, political turbulence, increased role and institutional differentiation, allocation of roles by universalistic and achievement rather than particularistic and ascriptive criteria, and increased dissensus among societal groups over the priority of goals, together with competition among them for resources (Scott, 1987, 146). Stinchcombe (1965) suggests that these general societal factors influence the development of organizations by motivating individuals to form and join organizations and by improving the chances that organizations, once formed, will survive. In nature, innovation is subject to selection and retention conditions (or processes). Newly enacted organization (and new knowledge) must survive selection and retention processes.

Stinchcombe's argument, then, includes the notion of the liability of newness: new organizations and, in particular, new forms of organizations are likely to fail. Literacy, urbanization, monetarized exchange, and political upheavals contribute to the creation of conditions that improve the likelihood of survival of newly formed organizations. Scott (1987) notes that "these arguments can still be sharpened." The analysis of the emergence of a new occupation such as environmental management may help sharpen arguments on the conditions for the emergence of organizations.

The "industry system" of environmental management arose by way of altering existing organizations, (rearranging blocks of work), creating new organizations (taking blocks of work from other organizations, instituting new blocks of work), and, through these processes and the historically specific conditions in which they arose, environment management has created a new organizational form (Hirsch, 1972, 1985).

Under such circumstances the liability of newness operates for both the new organizational form and new "industry systems."

In asking why the environmental organizations have survived, we might look to the role of both literacy and specialized advanced schooling, and to the role of political upheaval. Specifically the growth of knowledge and currents of "professions in process" in environmental work regions has stimulated new knowledge, have added new kinds of "environmental literacy" as a subuniverse of knowledge, set up new programs of specialized advanced training in the universities and colleges, and contributed to continuing political upheaval'. This development "acts back upon" the new organizations (and new organizational form) helping to institutionalize environmental management.

The "origins effect" of the 1960s-early-1970s environmental movement at a time of political upheaval clearly has partially dislodged vested interests and loosened resources for new uses.¹⁰ One of the arguments for the rise of organizations is that they are called into existence by the increasing need to coordinate and control complex administrative and technical tasks and transactions (Scott, 1987, 154). Environmental work could be seen from this "rational" perspective (Scott, 1987) as a partial institutionalization in a work form of complex administration and technical tasks and transactions in a type of action bureaucracy.

Scott notes that technology and bureaucracy are "more than hardware and filing cabinets." A natural systems organizational theorist would emphasize that the form of bureaucracy connotes a distinctive "sphere" in social enactment:

. . . (a sphere of) competence, the importance of proper procedures, orderliness, predictability, and attitude of "moralized anonymity" (Berger, Berger, and Kellner, 1973, 23-62).

It is important to emphasize that such beliefs are widely held by people in modern society and are continually being created and reinforced by a wide range of corporate actors and forces: universities, professional groups, public opinion, the mass media, the state, law. Thus, these beliefs do not exist merely as general values that support organizations, but take on very specific and powerful forms in a variety of guises - as

professional expertise, as procedural rules, and as legal requirements.

In short, . . . the environments of organizations . . . are increasingly institutional, specifying rules and procedures and containing rationalized myths and roles that organizations are rewarded for incorporating. (Scott, 1987, 155).

The general argument of the institutional perspective is that organizational success can depend on other factors than efficient coordination and control. As Meyer and Rowan (1977) put it in their classic argument: "Independent of their productive efficiency, organizations that exist in highly elaborated institutional environments and succeed in becoming isomorphic with these environments gain the legitimacy and resource needed to survive." Surely the new organizational forms of environmental management are surviving through enactment, selection and retention processes (Weick, 1969) reflecting Western bureaucratic practices.

However, a defect in the institutional view as presented is that the idea of "succeeding in becoming isomorphic" with an already "highly elaborated institutional environment" (such as the long history of "institutionalized organizations" in public schooling organizational environments) leaves out the question of how environments become "highly elaborated" in an institutional sense. The "becoming isomorphic" view also leaves out how highly elaborated institutional environments may vary in the degree of elaborateness, their efficacy, their salience or capacities. That is, there can be an ebb and flow to such environments. For example, labor traditions (a type of highly elaborated institutional "defensive" response) can be vibrant or suffer under variable conditions.

While the environmental movement has not yet realized its potential to fundamentally transform institutional environments, even in its current guise (as "new change marching in old clothes") environmental management holds promise for its social liberation component in challenging basic institutions. For the present, however, it appears that the environmental movement and its social problem process is primarily operating in a way

to broaden the scope of it's current, partial institutionalization as "environmental management".

Berger and Luckmann discuss the scope of institutionalization within societies generally and present a theory of institutionalization. They note that

Institutionalization occurs whenever there is reciprocal typification of habitualized actions by types of actors. Put differently, any such typification is an institution . . .

. . . Institutions further imply historicity and control. Reciprocal typifications of actions are built up in the course of a shared history. They cannot be created instantaneously. Institutions always have a history, of which they are the products. It is impossible to understand an institution adequately without an understanding of the historical process in which it was produced.

. . . for the kind of reciprocal typification (in which a social world will be in process of construction, containing within it the roots of an expanding institutional order) . . . there must be a continuing social situation in which the habitualized actions of two or more individuals interlock (Berger and Luckmann, 1967, 54-58).

For our purposes the communication process and the labor process, (and territoriality in an eco-system sense) are relevant interlocking foci of typification and habitualization. Obviously the scope of environmental institutions include all three foci and there may be developing a sediment of "ecological traditions" joining the ebb and flow of other "defensive reaction" elaborated environments as new reciprocal typifications and habituations.¹¹

In their discussion of the transmission of sedimented meanings of an institution Berger and Luckmann emphasize that an instituted reciprocal typification

. . . is based on the social recognition of that institution as a "permanent" solution to a "permanent" problem of the given collectivity. Therefore, potential actors of institutionalized actions must be systematically acquainted with these meanings. This necessitates some form of "educational" process.¹² (Berger & Luckmann, 1967, 70)

Karl Mannheim's contribution to the sociology of knowledge included both theoretical work on perspectival social knowledge and an emphasis on the value of utopian thinking "which (like ideology) produces a distorted image of social reality, but which (unlike ideology) has the dynamism to

transform that reality into its image of it" (Berger and Luckmann, 1967, 10). Of course the utopian thinking must have its empirical "segments" or subsocieties and be acted upon through concrete social processes. Berger and Luckmann remind us that:

. . . All socially meaningful definitions of reality must be objectivated by social processes. Consequently, subuniverses require subsocieties as their objectivating base, and counter-definitions of reality require counter-societies (Berger and Luckmann, 1967, 127).
 . . . A subuniverse of meaning may be socially structured by various criteria - sex, age, occupation, religious inclination, aesthetic taste, and so on (Berger and Luckmann, 1967, 10, 85).

In the concerted activity of the occupational "segments" (subsocieties) described by Bucher and Strauss (1961), particular "senses of mission" and "characteristic work activity" were articulated and involved differentiated "subuniverses" of methodology. The stimulation of new knowledge created by the social movement-like "segments" within occupations and organizations can create the same kind of empirical "dialectical" social processes Berger and Luckmann are describing in general.

These new social purposes, then, generate jobs through specific organizational processes. And yet Berger and Luckmann's treatment is so general as to not directly suggest what these intermediate social processes might be, how they are used, or how the processes themselves are constructed. Under what conditions, through which processes, will reciprocal typifications enlarge the scope of institutionalization of a work jurisdiction to make it an occupation? Under what situations is there an ebb and flow of such institutionalization? Under what conditions and through which processes will the scope of institutionalization of an occupation decline?

Our point is that the objectivation stage (society as an objective reality) in an emerging work region of the occupational structure may well take time, may involve concerted activity such as characterizes the role orientation of "program professionals," may involve (only partly conscious) deeply coded, general societal processes that may still be

sorting themselves out and may display an ebb and flow under changing situations, or historicity. This historicity involves the manipulation of specific intermediate or middle-range processes, and also the innovation of new processes.¹⁴

Part of this historicity is the emergence of new organizations. But as objectivated, instituted "reciprocal typifications," new organizations require "second order" objectivation of meaning - they require legitimation

. . .to make objectively available and subjectively plausible the "first order" objectivations that have been institutionalized. . . The problem of legitimation inevitably arises when the objectivations of the (now historic) institutional order are to be transmitted to a new generation (Berger and Luckmann, 1967, 94)¹⁴

Four levels of legitimation are described by Berger and Luckmann. The first level is incipient legitimation (present as soon as a system of linguistic objectifications of human experience is transmitted, eg. kinship vocabulary ipso facto legitimates the kinship structure). The second level consists of theoretical propositions in a rudimentary form (explanatory schemes, highly pragmatic, directly related to concrete actions, eg. proverbs, moral maxims and wise sayings, legends and folk tales). The third level of legitimation contains explicit theories "by which an institutional sector is legitimated in terms of a differentiated body of knowledge" , providing "fairly comprehensive frames of reference" for the sector of institutionalized conduct.¹⁵ Finally, the fourth level of legitimation is labeled symbolic universes which are bodies of theoretical tradition that integrate different provinces of meaning and encompass the institutional order in a symbolic totality.¹⁶

The lives of organizational members, in an open-natural or institutional interpretation of new organizations, are characterized by socio-cultural accounts or scripts. The environment in which many new organizations legitimate themselves is seen as increasingly institutional, "specifying rules, and procedures, and containing rationalized myths and roles." Organizational survival depends on incorporating these rules,

procedures, policies and roles. Rules, procedures, policies and roles are third level legitimation "containing explicit theories" (eg., action bureaucracy and environmental management occupations) "by which an institutional sector is legitimated as a differentiated body of knowledge." How are the organizational and occupational lives of Michigan DNR water quality role incumbents influenced by such third level legitimation and scripted processes of institutional isomorphism?

DiMaggio and Powell (1983) studied a somewhat similar "federal grants policy" program which created a new organizational form. In their study of arts councils they noted there were three mechanisms conducive to isomorphism (increasing structural homogeneity) among organizations in institutional environments: coercive isomorphism (pressure from one organization on another), mimetic or imitative isomorphism (in uncertain environments to seem up to date), and normative isomorphism (carried primarily by professionals). Clearly emerging occupations and organizations in environmental management are characterized by both coercive and normative types of isomorphism. Scott notes about the first type:

First of all, coercive isomorphism results from formal or informal pressures exerted by one organization on another as a condition for its support or approval. In modern societies, the nation-state, as a vital source of resources and as a major locus of coercive power, imposes uniform structures and/or procedures on many types of organizations. For example, DiMaggio (1983) reports how the National Endowment for the Arts, a federal program established to support artistic endeavors, followed a grants policy that encouraged states and then individual communities to establish arts councils that played a substantial role in determining what groups would receive funds. In this manner, a relatively disorganized organizational field has become rather highly structured around "the creation of a vertical network of public and private arts agencies from Washington to local communities" (Scott, 1987, 155).

Formal or informal pressure exerted by one organization on another as a vertical institutionalization (for example, a "grants policy" that mandates certain organizational forms) invites the question: what is the history of the grants policy?

Berger and Luckmann have reminded us that all instituted activity requires "second order" legitimations. Both the instituted activity and

the second order legitimation have a history. Like the arts council grants policy, in the case of the water quality, WWTP construction grants policy we also have a "coercive isomorphism" and a vertical institutionalization. However, it is important to note that the vertical network requiring structural homogeneity among state civil service grants units, applicants, and throughout the previously "relatively disorganized organizational field" (of polluting municipalities and industries) was instituted as a social movement innovation. This social movement innovation, as an action program, involved federal funds and water quality standards to clean up the streams, rivers and lakes.

It is true, as Ellul (1964) notes, that the growth of certain beliefs and cognitions about the nature of the world and the way things happen has made the efficacy of bureaucracy a widely held belief continually "being created and reinforced by a wide range of corporate actors and forces: universities, professional groups, public opinion, the mass media, the state, law" (Scott, 1987). The model of "general societal processes" premised on an ideological level of the "Western cultural account" has not proceeded as the only deep structure. There are also institutional levels of "defensive reaction" on the part of modern masses and classes that often involve the state. In the origins of environmental organizations is a story in which people didn't trust the private sector to clean up the air, land, and water. The broad social movement has pushed for public mediation, intervention, and regulation in a continuing political upheaval which has freed up resources. This did not happen in a cultural vacuum, and the historical innovation of the "new federal model" which emphasizes bureaucratic form and expert roles (Scott, 1983), has influenced the shape and evolution of environmentalist organizations. Part of the story, then, of these new environmental management organizations is that they emerged as part of a new, emerging "societal sector."

DiMaggio and Powell (1983) have argued that organization literature is weak in the analysis of the emergence of interorganizational fields. To

say, as they have in such brief form, that "coercive isomorphism" results from a federal grants policy may work for arts councils, where the initiation was from the federal legislation and lacked a significant social movement base. But, for the case of environmental management, the federal grants policy was pushed by a significant social movement. If we use the "institutionalist" model of organizational emergence directly from a federal grants policy (requiring structural homogeneity of those new organizational forms), we locate the nature of the isomorphism in proximate causes when a more historically specific "natural history" analysis is called for.¹⁷

During the May, 1992 Stanford Center for Organizational Research (SCOR) Asilomar conference on "Emerging Organizational Fields" three papers presented seem pertinent this discussion. Frank Dobbins presented a description of the "public policy regime" of the Massachusetts state level and U.S. federal level shifts in late 19th century anti-trust laws regarding industry which changed the nature of the railroad industry at that time. His point was that the "institutional" level of the "public policy regime" affected market entry more than pure competitive (economic) theory would have predicted. While this is informative and suggests the importance for our case-study of the "new federal model" described by Scott (1983) as appropriate for the 1970s period, Dobbin's paper lacked attention to the causes of this (anti-trust) shift in legislation. "The state" is taken as the context and only the "policy" is seen as the institutionalizing action. But, at the same conference, Alexander's paper noted that this type of approach puts culture ("institutional scripts") in the passive voice. She calls for more attention to the origins of culture (that may subsequently lead to institutionalized scripts) - that is, she calls for a less passive and more active or generative view of culture. In this vein the McAdams conference paper presented a history of the civil rights movement as a "challenge and response" pattern: organizational fields emerge from challenges to incumbents, however there are structural

conditions associated with the political opportunities for success. His description of the civil rights movement through several decades was reminiscent of the Jenkins and Perrow (1983) treatment of the California migrant workers movement - that is, there are structural conditions or constraints that link to whether a social movement will be successful or not.

In approaching these conferences presentations, if we combine the Alexander paper with the McAdams paper, we would have the themes of how a social movement influences the emergence of organizational fields. One of the structural constraints (and political opportunities) for clean water managers was the "new federal model." The WWTP grants administration program is thus analyzed in a "value-added" model (Smelser, in Toby, 1964) where one component feeds upon or sequences into another with one result being the partially independent outcome of a set of "program professional" occupational labor market positions.

Following Abbott (1988), we would see an occupational outcome of emerging organizational fields as a "horizontal" and self-regulating tendency. On the other hand, following Scott and Meyer (1983), we would see an organizational outcome of such an emerging organizational field as a "script" of the "new federal model" with a relatively passive project manager (grants unit) role. While such a tension between "professional" and "bureaucratic" action has been noted before, the element of a social movement influence (in an emerging organizational field) that is only partially institutionalized may suggest that Wilensky's model of "new mixed forms" of professionalism deserves more study.

There is, however, clearly an "institutionalized organization" dimension to the origins of the WWTP grants program. As part of a "mandated network" (Aldrich and Whetten, 1981) emerging in a contextual milieu of the "new federal model" (Scott, 1983) characteristic of the historical period of its founding, the construction grants program was implicated in a "coercive isomorphism" (DiMaggio, 1983): The new units in

state civil services (WWTP Grants Units) were instituted as part of a newly formed organization-set spearheaded by the formation of the Environmental Protection Agency (EPA) and each state civil service unit had specific rules, procedures, policies and roles.

The social history of the environmental movement as it responded to resistance (Schnaiberg, 1980) helps explain why, to use Berger and Luckmann's discussion, the third level of legitimation (the explicit theory or "frame of reference" of a strong federal program) was initiated. The first level of incipient legitimation, involving linguistic objectification of human experience, was expressed by the farmers throwing the dead, smelly ducks on the capitol steps: "dead smelly ducks from the river downstream from the drain pipes." The second level of legitimations, theoretical propositions in rudimentary form, may be said to be highly pragmatic, explanatory schemes related to concrete actions as in the proverb "He who shits in the road shall meet it upon his return." They apply, in the case of wastewater management, to the building of moral maxims, wise sayings, legends, and folk tales about river water and effluents from human settlements. The third level of legitimation must move beyond propositions directly related to concrete actions ("We can't all shit in the stream") to explicit theories by which an institutional sector is legitimated, since most problems cannot be solved at the level of concrete action requiring no more than the maxim to elicit a permanent solution.

As a comprehensive frame of reference, bodies of differentiated knowledge often are required to be entrusted to specialized personnel who transmit them through formalized initiation procedures. The "permit system" of point-source, water quality standards, backed up by federal funds and mandated state program manager roles effected a "formalized initiation procedure" and also the rationalized myth that, if the specialized personnel in the Grants unit followed all 48 steps in the

grants process, it would bring continued funding and certification of having resolved the problem.

In the shift from mobilization (collective behavior) to power (political struggle to overcome resistance), the environmental movement gave significant impetus to the 1972 Clean Water Act and the 1977 amendments in the US congress which establish the "permit system" (third level of legitimation). The impact of "strong standards and federal money" was more than technical, it represented legitimation of movement goals.

Examining how roles emerged and were legitimated in this fairly comprehensive federal, state and municipality funding program, we follow the relationships between the idea of environmental management and the sustaining social processes of that idea. This task directs us to several perspectives on how organizational structure emerges and how new organizations facilitate the emergence of new occupations. Scott observes how the institutional perspective emphasizes,

. . .the extent to which rationalized elements in the modern social environments encourage the development of organizations:

The growth of rationalized institutional structures in society makes formal organizations more common and more elaborate. Such institutions are myths which make formal organizations both easier to create and more necessary. After all, the building blocks for organizations come to be littered around the societal landscape; it takes only a little entrepreneurial energy to assemble them into a structure (Meyer and Rowan, 1977, 345).

Zucker (1983) argues that the increase in organizations is due to more than just the profusion of rationalized institutional elements that, like prefabricated forms, can be assembled into new structures. In addition, the organizational form itself has become "the focal defining institution in modern society." (p. 13) In order to demonstrate that we are serious about achieving some goal or protecting some value, we must create an organization to symbolize our commitment (Scott, 1987, 156).

Scott concludes his review of the institutional perspective by emphasizing that, while he agrees that both technical (size, technology, etc.) and institutional processes (formal structure representing coercive, mimetic or normative isomorphism due to rules, procedures, set roles) give

rise to organizations, "it does not seem obvious that technical forces have given way to institutional forces" (Scott, 1987, 156) He notes that new technologies are constantly being created. Perhaps even the institutional form of bureaucracy itself may be fading in preeminence as its context and sustaining social processes are replaced with an era of new organizational forms.

According to Meyer and Rowan, the Western cultural account and the required legitimacy of social control in a turbulent environment has brought forth rationalized myths - "formal organization is necessary, it will solve our problem" is an example (See Emery and Trist, 1965). From Meyer and Rowan's (1977, 1983) view, bureaucracy remains the pre-eminent "rational-legal" mythic form.¹⁸

However, in a recent review, Heydebrand (1989) asks the question of whether new organizational forms are emerging in the contemporary political economy. He argues that there are new forms of organization due to a transition marked by environmental turbulence, rapid change, increasing complexity and uncertainty, and near-permanent crisis conditions which have undermined the rational myth of bureaucracy. Considering work organization forms in terms of structure, he presents six dimensions: size of labor force, object of labor, means of labor, division of labor, control of labor, and ownership and control. Working with these variables he identifies a general "postbureaucratic" type of organization, but argues a subhypothesis that postindustrial capitalism produces a proliferation of many different forms and combinations of forms "since organizational environments are becoming more complex and turbulent" (Heydebrand, 1989, 332).

This turbulence in the environment argument is a primary argument for Rowan as well in interpreting the sources of formal structure. But Rowan comes to the opposite conclusion: "Rational myths" increasingly serve as legitimations precisely because of environmental complexity and turbulence. Characteristic of many late 1970's interpretations of US

political economy, Meyer and Rowan's view (1977) shares some assumptions similar to Edwards (1979), Pfeffer and Salancik (1979), Useem (1981) and others who saw increasing abilities of the major corporate sector to control its workforce, reduce its resource dependence, and coordinate its communication. Along with dual economy theory, the "freezing" of 1950s and 1960s monopoly capitalism realities into these several theses in academe during the late 1970s was complemented by the Meyer and Rowan 1977 capstone: Institutional isomorphism through "rational myths" contributes to the reduction of turbulence and the stabilization of environments.

Heydebrand notes lingering problems in the institutionalist perspective around issues of change, transformation, and emergence. He says,

In theory, institutionalism addresses both innovation and reproduction. As Meyer and Rowan (1983, 21-22) put it,

"In modern societies formal organizational structures arise in highly institutionalized contexts. Professions, policies, and programs are created along with the products and services that they are understood to produce rationally. This permits many new organizations to spring up and forces existing ones to incorporate new practices and procedures . . . The formal structures of many organizations in postindustrial society . . . dramatically reflect the myths of their institutional environments instead of the demands of their work activities."

In practice, however, the institutional perspective focuses on the process of symbolic reproduction of form rather than on the nature of extent of change of the macrocultural, institutional environment (Heydebrand, 1989, 332).

In looking at the emergence of clean water management our point is that, once "the environment" begins to have (partially) institutionalized management structures as new work jurisdictions, the incumbents of the labor market positions have not only the "theory," e.g. of the "new federal model" (project manager roles administering federal grant money and regulating in terms of federal and state pollution and permit standards, with citizen participation), they also may, as a type of work, as "legitimizers," develop a measure of autonomy in articulating the sphere of legitimation: now, not in terms of the organizational level or the institutional level, but in terms of the ideology of the occupational

level. Here origins effects mix with social movement effects, cohort effects and growth of knowledge effects to help produce conflict "segments" or program professionals.

In summary, general societal structures and processes which shape and channel the structures of new organizations and their emerging occupations include 1) general social factors (literacy, schooling, urbanization, money economy, political upheaval, institutional differentiation, universalistic allocation of roles, increased dissensus and competition), 2) need to coordinate and control complex administrative and technical tasks and transactions, 3) institutionalized "rational myths" making certain building blocks of organizations necessary, 4) vertical institutionalization mandating organizational forms, 5) various kinds of social movements (partially) institutionalized into new organizations, and 6) shifts in the political economy. Of course, shifts in the political economy viewed generally as "increasing specialization and the division of labor", have been a major source of new occupations in both the "sectoralized" public sphere and the "proliferating" private business forms.

Increasing Specialization and Division of Labor

Early writers on the division of labor were responding to a basic change they saw in the bases of work in the social order. The classic writers, Smith, Marx, Durkheim, Weber saw an occupational structure shift from work organized in occupations to work coordinated in organizations. This shift has made the general problem of "staffing" in contemporary societies more central and has influenced the emergence of occupations (for example, by increasing the technical and institutional sources of organizational and occupational emergence). In early modern times occupation was still strongly hereditary. Abbott notes:

The sectoral differences of occupations were the major categorical differences in society; other categorical differences - of age and ethnicity, for example - had effects subordinate to them. The staffing problem in the modern sense, then, did not exist. But the breakdown of occupational heredity joined with growing

organizational dominance to produce the modern staffing problem. The staffing structures that address this problem are either well-defended hangovers from early modern times (apprenticeship in the trades) or new structures pioneered by upwardly mobile, highly organized groups (advanced education in the professions). Meritocratic arguments from the ideology of professionalism, egalitarian demands by successive categorical groups, and organizational needs for social control of the labor force have combined to construct a staffing system of great complexity (Abbott, 1989, 275-276).

Adam Smith described with fascination the organizational effectiveness of specialization and the division of labor as a new, modern organizational efficiency. Marx, seemingly wistful about artisanal labor, was raising, among others, the question of changing bases of consciousness in the social order by his focus on the labor process and the theories of class conflict. Durkheim's notion of corporate communal organization searched for substitutes for occupational community. Durkheim and other classical writers did not foresee the importance of the kinds of "problems of staffing structure" Abbott notes (meritocratic arguments, egalitarian demands and organizational needs for control). Abbott concludes that it is time to shift to new questions. He says:

. . . Marx and Weber clearly saw that organizations would overwhelm occupations as (the twentieth century's) most important linking structures. (Both actually saw this too clearly, underrating the new professionalism and other anti-organizational manifestations). Recent writers on occupations, leaving the high plane of such issues, have emphasized processes of occupational change as well as the biographical experience of work. The positivist tradition has dissected the mobility of categorical groups within census-derived occupational categories. Theoretical analysis does continue among scholars influenced by Marx, who have retained his focus on the destruction of skill and the alienation of labor through organizational change. And numerous writers have analyzed credentialing systems, although few have merged those analyses with realistic discussions of the work system itself. It is indeed time to create a new list of theoretical problems (Abbott, 1989, 277).

Abbott notes that current questions about the occupational system revolve around four basic structures: "the division of labor, the organizations and occupations that structure and fight over it, and the staffing structures that channel non-occupational social groups into them" (Abbott, 1989, 277). He describes differences in how the division of labor works in different "regions" of the division of labor, and he asks how

boundaries fluctuate and what the respective roles of occupations and organizations are in shaping this regionalization.

Abbott's recent work, The System of Professions (1988) won the ASA "Scholarly Work" Award in 1991. In that book he examines the division of labor among experts. The emergence of jurisdictions occurs through cultural practices usually involving abstract knowledge. Such "professional" jurisdictions are established by conflict between professions over work. He argues:

There is a body of "problems amenable to professional-type work and a body of professions eager to do that work . . . (through cultural practices usually involving abstract knowledge) . . . problems with the body become diseases, disputes between people become legal cases. On the basis of their successful construction of problems, professions claim certain rights - from others in the workplace, from the public, from clients, and from the state. These other actors may then ratify, limit, or contest a profession's claims of jurisdiction, thereby creating a social structure for jurisdictions whose cultural structure arises in the original practices of the professions. At any given time, the system of professions comprises the problems professions work with, the professions themselves, and the links of jurisdiction - social and cultural - that bind one to the other (Abbott, 1989, 178). (emphasis added).

However there is one source of the "staffing" structure (of experts and other work) characteristic of the contemporary period which seemingly remains understudied: social movements. Social movements may not necessarily be guided by meritocratic or single-issue egalitarian social goals, or by organizational control ideologies, demands or needs. Any particular social movement may have different goals than the ones Abbott locates as driving the staffing system. But whatever the goal of the social movement, it is true that many jobs and occupations have been created by them. Social movements, it would seem, should be ranked as a major source (labor market creation, occupational structure definition and recruitment, influences on new credentialing systems, stimulation of the growth of knowledge) of the modern staffing system.

As Wilensky observed long ago (1964) in his discussion of "claims for jurisdiction," there might be role orientations in the "new professions" that were neither strictly professional or organizational,

but included "missionary" goals in work behavior, both organizational and occupational, as structure emerging from social movement ends. Such a "resolution" of professional, organizational, and social movement controls was viewed as an important potential of the "mixed, new types of emerging professions."

If we now turn back to Abbott's discussion of sources of staffing, we notice, as noted above, that social movement goals are underemphasized. Weber observed the obvious importance of the "routinization of charisma" and it is evident that many social movements have influenced jobs and occupations in recent decades. This topic will be discussed in a later section, but, for now, it is important to notice that, when Abbott says the professional region of the division of labor is carved out by largely internal dynamics of the individuals and groups within the profession, and in his specific historical description of the "social and cultural links" between "the problems professions work with (and) the professions themselves", he has left us not knowing, in any detail, how a "region" gets constructed. There are sources initiating the professional project. It would seem, in the case of social movement instituted "regions" of expertness, that it is the social and cultural links of the movement that construct both the problem and the new knowledge and new roles. It is not that the "other actors" (aside from the experts themselves) "ratify, limit, or contest" a profession's claims of jurisdiction - it is, in the case of a social movement instituted profession, the social movement which initiates the jurisdiction (not merely ratifying, limiting or contesting the expert groups claim of jurisdiction). The type of cultural work that needs to be examined in understanding the emergence of a social movement influenced occupation, then, includes the initiation of regions of abstract knowledge. Abbott's persistent emphasis is on jurisdictions as existing and being exchanged. He says jurisdictions are

. . . (exchanged) through cultural work. Medicine defines children's misbehavior as hyperactivity. Architecture defines urban planning as a larger version of design. Clergymen define the meaning-of-life questions of the dying

cancer patient as religious, not medical, matters. The professions compete by redefining other professions' work into their own terms; they compete by claims argued through abstract knowledge. This is not, of course, to ignore the many other means at profession's disposal - alliance with dominant classes, use of state power, creation of subordinate divisions of labor, and so on. But all these aim to cement a claim that is first and foremost based on statements that "what looks like a part of their work is really understood as part of ours." The professions, in short, establish their division of labor through a competition whose currency is abstract knowledge (Abbott, 1989, 278-279).

All this is true and fascinating. Abbott goes on to note that, of course, abstract knowledge is not the "general currency" of all "regions" of the division of labor. In the manufacturing region of the division of labor, the contest between management and workers is more important than contests between the more or less free competitors (of the professions), and, in the construction trades, negotiation and competition takes place, but with a currency different than abstract knowledge. He argues:

We must take a new approach to the division of labor, specifying the various processes by which actual divisions of labor are established. . . these various processes can be nested inside one another . . . we must then discover the conditions of their succession (from within which nesting to which?) (Since) there is little mistaking the emergence of bureaucratic, Bravermanian deskilling in the larger professions in the last 50 years . . . Does this mean that the production of expertise, like most other modern production, will hereafter be institutionalized in organizations rather than in individuals, that professionalism - the very notion of institutionalizing expertise in individuals - is dead? Under what conditions can professionalism recoup against the subdivision and bureaucratization of professional work? (Abbott, 1989, 279-280).¹⁹

Notice, however, that in his description of other means to cement a claim of jurisdiction (alliance with dominant classes, use of state power, creation of subordinate division of labor) he ignores the role of social movement goals and influences. Yet one way to answer the question of the fate of "occupationalness" or the emergence of occupational social structure and group consciousness is to study the sources of and processes of emergence of consciousness in social movements and in social movement dimensions of staffing systems.

We are suggesting he add a "region" to the division of labor of (partially) institutionalized social movement created occupations (PISMO). And that further work in this area would make one good lead for understanding some contemporary conditions for the production of expertise. The external authority of the social movement stimulates new knowledge and new expert roles as well as altering existing roles.

"Occupationalness" resembles class consciousness; it results from social and cultural structuring of merely implicit links. Our argument is that the partial institutionalization of social movements into types of work ("the same kind of work") that becomes an occupation is understudied (Abbott, 1988, 149). The term "occupationalness," then, serves to suggest the potential that social and cultural structuring of both "merely implicit links" in the environmental field (cohort effect, knowledge effect, contextual effect), general societal rationalizing processes as "scripts," for example "the new federal model" (contextual effect), and also some explicit links (social movement effect both as internal work jurisdiction segments and as external movement lobby influences, and cohort effect) may be shown to be producing an "occupationalness" amongst clean water managers.

Certainly social movements (to which we will return) are only one source of change, one "external force" impinging on the system of professionals creating regions in the division of labor. And, if we look at the several regions of the division of labor (manufacturing, construction, marketing and distribution structures, other services) as well as the system of professions, it is clear that general changes in demand for goods and services remains the primary driving force behind whatever occupational and organizational changes are occurring. What is the relation of consumption (private and public demand) to the division of labor - that is, as sources of jobs and occupations?

Private and Public Demand

In the underlying shifts in demand as seen by economists and the marketing professions - underlying shifts associated with changes in income, population, new waves of innovation, and changing consumer tastes - lies the explanation for most change in jobs and occupations. The evolution of private demand and supply (or "industry structure", Brockbent, 1987) is seen, in this view, as driving production and consumption. While the production for need continues to be also a need for production (Marx's dialectical insight of the identity of production and consumption), production dominated by organizations, rather than by conscious social groups such as occupations, remains the most common situation. (A situation that, from this view, remains submerged in our role as individuals and consumers).

Abbott notes the necessity of the consumption role in modern production and observes that, among the many questions about the "staffing of consumption", is how it is socially constructed as a type of emerging "occupation."²¹

Public consumption, however, may provide different leads into the "new occupational structure." Here, the expansion of public goods have been associated with the emergence of many new jobs and occupations in "limited critical sociology" (or social problems area jobs and occupations) (Gouldner, 1970) "social overhead costs" (eg. civil engineering, general infrastructure public services), and in "social industrial complex roles" (welfare coalitions) (Heidenheimer, Heclo and Adams, 1983; Evans, Rueschemeyer and Skocpol, 1985; Wilensky, 1983 and 1975; Carnoy, Shearer and Rumberger, 1983; O'Connor, 1974). These non-market "contradictions" of the welfare state (Offe, 1985) have contributed to much discussion about "legitimation crises," disincentives to work, stabilization crises and other political level matters. However it should be noted that many of the new mixed forms of "program professionals" in the new, emerging social movement instituted jobs and occupations over the

last few decades have emerged precisely in these areas of "collective consumption" (Castells, 1981). Abbott asks:

Much of the relation between organizations and occupations, staffing and the division of labor, is determined by the state... In the United States, the state has undertaken endless rearrangements of the organizational side of the staffing structures through negative sanctions, incentive systems, and formal regulation. These rearrangements reflect the demands of categorical groups seeking recognition.

. . . Does the willingness of the state to listen to categorical groups provide a new counterweight to organizational dominance, replacing the lost authority of occupations? How and why do states utilize and control staffing structures? (Abbott, 1989, 287).

There are so many ways various movements use the state that limiting the state role in staffing structures to "listening to categorical groups" is far too narrow a perspective. Abbott does emphasize the role of education as an implicit model for later industrial relations and as a "winnowing" device. Indeed, the education system is seen as central to the staffing system.²² But activity in the public sector related to the emergence of staffing structures is far more complex than the educational institutions alone. Many social movements have partially institutionalized in the public sector. He notes:

. . . the condition of the household division of labor, the policies of the state, and the alternative functions of education do not exhaust the factors shaping the balance of the four fundamental structures of work (the division of labor, occupation, organization, and staffing). I have only touched on a few issues of outstanding importance (Abbott, 1989, 288-289).

His view of education as largely institutional (staffing function) rather than ideational (content) is helpful yet seems disconnected with his earlier discussion of the system of professional occupational dynamics around abstract knowledge as (ideational) currency. And it neglects some of the microprocesses discussed by Bucher and Strauss around "segments" asserting claims around "characteristic work activities" and "missions" which stimulate important contests over methodologies, doctrines and knowledge to be applied. In seeing education largely as a staffing function, Abbott's conclusion relegates the abstract knowledge fought over by professions to an undialectical status: consciousness really does not

matter for an occupation as a collectivity if it is not consciousness about something. Adding social movements as one of the central linking structures of the division of labor could enhance the needed emphasis on consciousness. Abbott concludes:

The question of the new occupational structure, I have suggested (through the 1989 article) has less to do with the history of occupations than with the history of work in general. The central theme of that history in the recent past has been the replacement of occupations by organizations as the central linking structures of the division of labor. That change produced a need for direct mediation between organizations and society, a mediation provided by the staffing structures. If we can understand the forces producing these large-scale changes, an understanding of most changes internal to the occupational structure will follow from them.

. . . Only substantial theoretical inquiry can tell us (the future of the new occupational structure) and, as I have argued throughout, our past agenda of problems and issues has kept us from that inquiry. If we can understand how different divisions of labor proceed, whether and how occupations become real, how we and others imagine work, how consumption has become work, and how the various forces of the work world trade off with one another, we may be able to understand the future of occupations and of work generally (Abbott, 1989, 289-290).

Whether and how occupations become real is one of the central questions of this study. Our suggestion in general is to add to Abbott's agenda a "region" in the division of labor of partially instituted social movement jobs and occupations (PISMO). This phenomenon is seen as composed of both a set of processes and an historically specific set of outcomes and, having indicated its general nature as outcome and in initial terms with regard to social movement, social problem and occupationalizing processes, we will now refer to this general phenomenon at times as PISMO or PISMO processes.²³

Our case-study attempts to delineate the transformation of work in one such recent social movement - the environmental movement - from "jobs" to the emergence of "occupations." We have emphasized that in order to do that the carriers of the new knowledge stimulated by the social movement, and the new jobs and occupations emerging with the social movement instituted organizations need to be systematically studied. Part of that systematic study would include careful, detailed job histories locating

macro, middle range and micro-processes of occupational emergence in that social movement instituted "region" of the division of labor.

Social Movements

Blum, et al. (1988) provide an opening for the study of emergence of occupation. She says:

Hughes (1958) indicates that a new occupation emerges from work "formerly performed by amateurs, or for pay by people with little or no formal training" (p.133). He cites three origins of new occupations: technical developments, social movements, and new social institutions (p. 133) (Blum, et al., 1988, 98).

Our approach is consistent with Freidson's (1970: 71) definition that an occupation exists when workers perform the same activity and develop common methods that are passed on to new recruits. It is also consistent with Goode's (1957) characterization of those occupations that are professions, requiring a minimal equality among its members in what they do, their occupational role (Blum, et al., 1988, 97-98).

We have added to Hughes list of sources of new occupations, in this section, a set of processes relevant to the creation of a "region" of the division of labor: the middle-level social constraints, social opportunities and social processes that build-up an occupational collectivity.

As one of these middle-level processes we can note that a social movement can act as a continuing type of social control on work behavior, both as a goal perpetuating itself as an "origins effect," and as a continuing influence. This is an emphasis which seems realistic but is missing in much discussion of occupations, professionalization and semi-profession. For example Abbott (1989) makes inroads in analyzing the new occupational structure(s) by asking if the division of labor operates in the same way throughout the work system and he pursues the inquiry of examining how the regions of the division of labor are established. He notes:

... how are the regions of the division of labor established? How do their boundaries fluctuate? What are the respective roles of occupations and organizations in shaping this regionalization?

As an example of a regional theory of the division of labor, consider my analysis of the division of labor among experts, or as we usually call them, professionals (Abbott, 1988). The division of

labor between professions is established by conflict between professions over work. There is a body of "problems amenable to professional-type work" and a body of professions eager to do that work. Through cultural practices usually involving abstract knowledge, professions construct the problems into jurisdictions (e.g., problems with the body become diseases, disputes between people become legal cases). On the basis of their successful construction of problems, professions claim certain rights - from others in the workplace, from the public, from clients, and from the state. These other actors may then ratify, limit, or contest a profession's claims of jurisdiction, thereby creating a social structure for jurisdictions whose cultural structure arises in the original practices of the professions. At any given time, the system of professions comprises the problems professions work with, the professions themselves, and the links of jurisdiction - social and cultural - that bind one to the other (Abbott, 1989, 277-278). (Emphasis added).

Abbott's call to "specify the various processes by which actual divisions of labor are established" is helpful. However, to repeat, we might want to suggest a "region" of social movement institutionalized occupations. When Abbott interprets jobs becoming professions on the basis of the individuals and groups within that work activity "successfully constructing problems and claims of jurisdiction" he leaves out the region where it is precisely the social movement and its' "origins effect" which first establishes the jurisdiction, and then the new region of the division of labor may "professionalize." And, again, to repeat, it is not that the social movement (constituency) may just "ratify, limit, or contest" a profession's claim of jurisdiction - the social movement is the social and cultural origin of the new job jurisdiction.

It is true, as Abbott notes, that professions compete by "redefining other's work into their own terms; (that) they compete by claims argued through abstract knowledge" and that such "currency" of abstract knowledge is crucial in understanding the professional region. It is not true that change in the system of the professional region is due solely to "whole new types of problems" that are created by imminent developments in abstract knowledge or only to the actions of professionals moving from one type of (abstract knowledge) work to another type of (abstract knowledge) work. Social movements play their part.

Zald notes that these PISMO reactions, these social movement influences, are going to be with us for a long time in the environmental field:

One might argue that the government has already responded to the threat through the creation of regulatory mechanisms at the federal and state levels, such as the Environmental Protection Agency, the Occupational Safety and Health Administration. Haven't we institutionalized mechanisms for assessing risk and limiting dangers?

Two features of the underlying set of problems suggest that new outcroppings of the negative externalities of industrial society, and new groups and movements that no longer can accept the costs, will be part of the social-movement landscape. First, negative externalities are created in the form of unknown by-products of industrial processes and product (Mitchell, 1979). Only by preemptive and prohibitive research can the effects of all industrial processes and products be known before the damage occurs (Douglas and Wildavsky, 1982). . . . Thus the creation of issues for action is inevitable, though some risks can be avoided.

Second, the burden of the cost of different negative externalities falls on different groups at different times. . . . Mobilization and community organization to cope with the fallout from these failures represent a movement entrepreneurial opportunity that will come often (see Walsh, 1981; Walsh and Warland, 1983). As new problems emerge, affecting new groups and communities, local movements, linked to circles of experts and professions, are likely to result.

One feature of these postindustrial or late industrial movements is that their definition and resolution call for a heavy dose of expert opinion. Analysis of the interplay of causes, costs, consequences, and options requires extensive knowledge of esoteric subjects, unavailable to even relatively well-educated laypeople. In modern society, experts play a role in defining facts and issues for many movements - from issues of tax redistribution to the impact of pornography on behavior. Yet issues of technological fallout are peculiarly vulnerable to battles over technical definitions and complex but often ill-defined systems of causation and long-term effects. In this situation movements become battles over expert definitions, and the ability of parties to command expertise becomes an important part of the power equation (Molotch, 1970). (Zald, 1988, 25-26).

However, it is important to keep in mind that when Zald quotes Molotch writing in 1970 (who had analyzed the Santa Barbara oil spill) he is reaching back to a era when, in particular, the environmental movement had just achieved a significant new level that ultimately led to major legislation, many new regulatory roles, the formation of myriad environmental associations, and the start-up of "professional" environmental studies, resource development, energy and ecology, and environmental engineering programs at the universities.

In other words, it was the movement that created many of the subsequent experts who have since come to play a role "in defining facts and issues", that is who have since become the experts in the "battle over technical definitions" where "movements become battles over expert definitions." It is not just, as Zald has it, that consumer movements (and other types of movements) have an increased capacity to "link" their issues to professional careers (McFarland, 1976), but also that as a "region" in the division of labor the "social movement sector" or the PISMO process has institutionalized much of the impetus for new occupations and the new abstract knowledge they are based upon.

The type of build-up processes and type of group consciousness characteristic of each social movement-instituted occupation may be different under different circumstances. For example, in the public planning fields Ross (1975) studied the rise of the "advocate planner". This was a case where the origins effect was not limited to "negative externalities" of industrial society in a technical sense but rather an issue of non-access by communities to planning policy determination. The community-based urban movements generated a "profession in process", the advocate planner.

Attempting to generalize about social movement influenced occupations requires some kind of model of collective behavior or social change. Jackson Toby describes Neil Smelser's "value-added" approach as articulated in Social Change in the Industrial Revolution in the following way:

Professor Smelser suggests a seven-stage model to describe social change resulting from the increasing differentiation of a complex society: (1) dissatisfaction, (2) unconstructive disturbances, (3) efforts to cope with dissatisfaction without structural change, (4) social encouragement of new approaches, (5) efforts to specify innovation, (6) implementation of the change, and (7) routinization (Toby, 1964, 578).

Generally, utilizing Smelser's model, we would argue that "occupationalizing" fits in as step 5 "efforts to specify innovation." While the instituted roles in environmental management may seem to have

long-since reached steps 6 (implementation) and 7 (routinization), the focus of our study is on how a partial institutionalization of steps 1-4 (early social movement) can lead to a feedback loop after implementation (federal legislation of positions) and institutionalization (15 years of program) to continuing efforts at innovation, due both to a continuing social movement and to the other effects indicated (complexity, knowledge, cohort, rapid change, new problems).

However, while the issue of public demand for a (set) of occupations and continuing social movement influence seems obvious, this phenomenon is seemingly often missed in the organizational theory and design literature (for example, Mintzberg, 1983, largely ignores public sector, social movement influenced, "mixed forms of control" in his five types of coordination). This issue seems also to be missed in labor market influenced approaches to professional bureaucracies. The fact that the ideologies of socialism are waning does not mean that the phenomenon of public tensions establishing and maintaining public sector turf has necessarily diminished - especially in the infrastructure, health, and environmental fields. It is in these sectors that many of the recent social movements have been making their impact with new organizations and new occupations. It may yet be that many of the movements will ultimately contribute to new institutions.

New Institutions

Each of the sources of occupation we have reviewed - new knowledge, new organizations, increased specialization and division of labor, social movements, and changes in public and private demand - has been associated with the emergence of major institutions of the social order. The new institutional sector of environmental management emerging over the last twenty-five years has been founded by the ecology movement. This movement has influenced a wide range of environmental services and, as new institutional arrangements in government programs and business, influenced the emergence of new occupations through such structures and processes as

pushing to generate new knowledge, founding new organizations, contributing to both increasing specialization and division of labor (including a set of new interorganizational fields within the environmental "region" of work), altering private and public demand, and influencing other social movements.

Many other older and new social movements have created new institutions. The labor movement and reactions to it created new institutions in government and law (Labor Department, NLRB, labor law, collective bargaining institutions, wage determination "institutional complexes") (See, eg., Piore & Sabel, 1984). Other social movements emerging in recent decades that have created new institutions include adult education, civil rights, health and safety, feminism, peace, and consumerism. Examples of the ways that these and other social movements create occupations in the process of institutionalizing will be discussed in a subsequent section. The institutionalizations of social movements fits into what was referred to above as the Western cultural account.

Western Rationality: A Cultural Account of General Societal Rationalizing Processes

New laws, administrative agencies, and professional occupations are continually being created, giving rise to new rationalized myths. Do the emerging PISMOs use the "building blocks of organizations" unreflectedly? It is true that these "blocks of culture" are bases for organized action. They are "strategies-of-action" (Swidler, 1986). However in this emergence process there are ambiguities and competing tendencies (Scott, 1987, 141). Attention, for example, should be paid to the evolving consensus within sectors that, as the dynamic of a developing "balanced network" (Benson, 1975) help build-up and maintain them (Rowan, 1982, 262; M. Meyer, 1987). Would a cross-section of all newly emerged large interorganizational fields or "industry systems" show them all equally determined by pressures for structural homogeneity from institutional rules, procedures, policies, and roles?

Scott and Meyer's call for "cross-societal and cross-sectional" research on these emerging sectors tends to ignore the longitudinal aspect of this process. They do, however, attend to "rationalizing processes" in a case study of how a sector grows (Scott and Meyer, 1983, Chpt. 5, "Aging and Reform Movements"). Here five rationalizing processes operating at the ideological (or institutional), the organizational, and the individual levels are traced as developmental features of a general societal process:

(1) An area is identified for rationalization; (2) forces are mobilized calling for reform (mass-based organizations develop, existing organizations activate, newer associations are formed); (3) professional groups have interests in reform (their job is to initiate and help shape such reforms); (4) reform efforts are viewed as resting on a rational and scientific base that must be extended. (The promise is held out that the area of concern can be reorganized and put on a more scientific basis). Calls are made for more research, for more and better trained personnel, and for the more efficient organization of services; (5) The practitioner knows what is in the best interests of the client, that is, the professional concept of a client's needs is based on some definition of homeostasis, departures from which require attention (Scott, 1983, 118).

Scott argues that, once an area has been "opened up" by these processes, it becomes easier to legitimate new professional specialties, occupational roles, and types of services; and older professions explore ways to expand their services to the new area. Rationalizing processes "let the light of legitimacy shine in," encouraging new organizational ventures to grow (Scott, 1983, 118). However, as mentioned, if we compare such societal sectors in a cross-section view only we miss the story of their historical development. We may miss examining the question of the nature of extent of change and in looking, see only general forms.

In understanding rationalizing and organizing processes, the historical context in which they are occurring is crucial for highlighting their distinctive features. The particular conditions present at the time of their unfolding may, as Stinchcombe (1965) argued, mean that organizations (and sectors) founded at a particular point in time tend to share certain characteristics. The same cohort of organizations may be

imprinted in some fashion by administrative images, technological imperatives, and environmental constraints prevalent at the time of their founding. It is important to assess factors present at the time at which social movements give rise to new types of formal organizations (Scott, 1983, 119).

There is some activity to make these kinds of studies. The recent 16th Annual SCOR Asilomar Conference (Monterey, May, 1992) described earlier had, as it's theme, "Emerging Organizational Fields." We may note here that the initial clean water management programs were initiated in a "cooperative federalism" period of the early 1970s but there was a shift to "coercive federalism" (Kincaid, 1990) by the late 1970s. The WWT grants unit we study evidenced less engineering and facilitation of the growth coalition, and more regulatory and environmental activities after this shift. This examples the importance of changes within an emerging organizational field. Increasing attention has been focusing on the topic of the processes and types of emerging organizational fields in organizational theory. Michael T. Hannan has recently noted:

. . . I'd say there is a lot of interest now in organizational evolution, in trying to understand the analogues of speciation, the conditions under which or the processes that govern the creation of new organizational forms rather than just new members of a population (Hannan, 1992 winter Academy of Management OMT (Organizational and Management Theory Division) Newsletter).

These things being said, we are still left with an inadequate view of how sectors grow. The institutional perspective that the most relevant underlying process is the Western cultural account of general societal rationalizing processes is informative but underemphasizes the potentials for substantial rationality. The theoretical argument about deep cultural determinations versus processes of substantial rationality is complex and cannot be undertaken here (see Alexander, 1985; Habermas, 1990). However, it would seem that the general impact of social movements on "professions in process" is such an empirically prevalent phenomenon in recent decades that more attention to the processes and conditions under which substantively rational social structure and group consciousness are

built up is needed. That is, the institutionalist perspective leaves us with the same question about social movements that Heydebrand addressed concerning new organizations: in theory institutionalism addresses both innovation and reproduction, but in practice the research strategy has emphasized the process of symbolic reproduction of form rather than focusing on the nature of extent of change. Does it not seem that the many (often social science relevant) social movements introduced have, indeed, contributed to substantive rationality of goals and ends (an educational society, civil rights, gender liberation, ecological paradigm consciousness, mental health and self-leadership, increased safety and health goal attainment)? In the processes of build up of social structure and group consciousness characteristic of social movements it could be argued that the substantive goals are as noteworthy as the general rationalizing processes or societal instrumental rationality forms (see Habermas, 1990).

In this section we have identified and briefly described several sources of emergence of occupations. We have reviewed macro level sources of new jobs and briefly indicated insights from the micro level tradition (which has studied the cultures of individual occupations as ethnologies).

Macro, Micro and Middle Range

What may be needed for our study of a new set of occupations are case studies that link micro and macro processes in ways that can generalize about conditions and processes of occupational emergence.

Blum and associates have argued this way:

What is generally missing...are "middle-range" studies that examine occupations as collective entities. As Friedson (1985) points out, there are social constraints that allow various combinations of tasks into role bundles we call occupations. The process by which role bundles are made up and organized, the power those occupying the roles exercise, and how they exercise it are all crucial for better understanding of the division of labor (Blum, et al., 1988, 97).

Their approach is to suggest that there is a series of elements necessary for the emergence of a new occupation. An important contribution of their

study of employee assistance program "program coordinators" was the development of a method for defining when an occupation has come into being. To do this they assess commonality within an occupation among role-occupants with diverse socialization backgrounds.

Weber noted the problem that creating stable jobs makes for a social movement. Over time the social movement charisma must become (at least) partially institutionalized into staffing structures within labor market "regions". This was the burden of our review and critique of Abbott (1989) - that he has not emphasized the concept of "region" of the division of labor enough, especially in the "professionalization" processes of expert jobs becoming occupations. Blum and associates note the subsequent problem of training:

As mentioned, Hughes observes that new occupations must recruit from existing occupations, leading in time, to the emergence of issues about formalized training for the new occupation. This, in turn, eventuates in a progressively more formal credentialing system, placing clear boundaries around the occupation and closely governing entry (pp.134-135). (Blum, et al., 1988, 98-99).

In our look at sources of new jobs we noted that macro theories of stratification and political economy, social movements, and aspects of occupational and organization theory have made their contribution. Macrosociological study of the structural dimensions of work has, of course, been a dominant trend in the discipline. In terms of the analysis of the emergence of occupations out of labor market positions, theory should also attempt to locate a "middle range" of problems such as under what conditions, through what processes, and when do occupations emerge? Finally, we can ask the micro level questions about face-to-face interaction and the build-up of social patterns. (See Ritzer, 1987, for a discussion of the need to integrate these levels, and Burns, Baumgartner and DeVille, 1986 for an attempt at a theory of actor-system dynamics).

We have indicated that the difference between an occupation and a job involves whether there has been a build-up of social structure surrounding the work and whether it is characterized by a conscious social group. Work activity in a labor market (a job for pay) does not

necessarily have to have much social structure or group consciousness. Because of this definition, the dynamic aspect of occupation (as structure and consciousness) directs us to also examine the interaction between microprocesses and background social structural and "middle range" conditions and processes such as internal "occupationalizing" related, for example, to social movements within organizations, and to other similar "turf," "professionalizing," and "power" phenomena.

All these questions lead us to specific bodies of theory in the organizations literature such as "institutionalist," "interorganizational linkages," and "negotiated order" models (Scott, 1987). Dynamics relating more closely to conditions and processes of social movements direct us to resource mobilization theory and other theories of social movement. Recent work in economic sociology and labor market studies are important. Many new occupations can be analyzed as emerging and being maintained or altered in part through social problems processes, as the occupation-forming part of the "social problems industry." Many types of new environmental occupations are knowledge intensive fields and this fact directs us to the works the sociology of science, new class theory, sociology of knowledge, and parts of critical theory.

We have located a central guiding theoretical question beyond the details of environmental work and the general issues of structure and process in sources of occupations. This question lies in the problem of identifying the sources of the emergence of a conscious social group. The theoretical and practical problems of an emerging occupation therefore reflect enduring, central sociological questions. Analysis of social movements has been a major focus of enduring theoretical work. At both the macro and the middle range we can ask what differences there are among social movements that affect creation of new jobs? How do the partially institutionalized social movement organizational and occupational (PISMO) processes work? How do jobs created by social movements differ from other types of work?

SECTION TWO: HOW SOCIAL MOVEMENTS AFFECT JOB CREATION

Social movements are sources of tension in a social order. We have seen how a social movement such as the environmental movement can change the social order by creating new jobs. In general, social movements may signal unseen characteristics and possibilities within a given social order (Giddens, 1987, 48). As social movements utilize a reflexive appropriation of knowledge about social life to establish and sustain a labor market position (a job), new collectivities (as occupations) become connected to or work in alliance with elements of the established social order.

Newer social movements (adult education, civil rights, ecology, consumerism, health and safety, women's movements, mental health, peace) have stimulated sociological imagination adding to that produced by continuing study of ongoing social movements of more traditional sociological concern (political, ethnic, religious and labor movements). Studies of occupational emergence as the institutionalization of social movements, however, seem underrepresented in the sociological literature. Our case-study of the emergence of a sample of new occupations in the environmental management field (presented in Chapters 3 and 4) makes us ask what literature can help us? What are the right questions to answer?

Action Organizations May Lead to Institutionalized Organizations

Our case-study emerging water quality occupations were socially constructed through the "technology" of a "new federal model" as a specific organizing and rationalizing process (Scott, 1987, 1983; Thompson, 1967). However their "origins effect" includes myriad lobby groups, action organizations and social movement activity. In the mobilization stage the environmental movement founded the Clean Water Act which made possible (objectivated) many water quality jobs (subsocieties of reciprocal typifications) including the large wastewater treatment plant (WWTP) and drains grants programs (third level legitimation of a

specific theory: federal funds and roles). (We have studied the Michigan Department of Natural Resources WWTP unit). Thus the WWTP sector emerged, that is, was effected by this "mandated coordination" (Aldrich and Whetten, 1981).

Once this large-dollar, federal program was initiated the building of WWT plants and drains was at the center of an intricately interrelated political, growth, regulation, and environmental infrastructure which as a societal sector or network process provided a "series of direct working relationships between organizations" as symbiotic partners (Hawley, 1986; Astely, 1985, 236). The public act mandated not only water quality standards and funds, but "project managers" to guide municipalities in their application for grants and conformance to standards: the water quality analyst. The history of these positions and their role incumbents is the subject of chapter 3. The extent to which the role incumbents have been a part of, or influenced by, the environmental social movement (and by other movements) is a part of our case-study. What kind of social movement is the environmental movement? What theoretical work on social movements can help?

Perspectives in Social Movement Theory and Types of Social Movement

Sociological analysis of social movements has centered on three types theory. Hannigan (1985, 435) summarizes them as:

1) traditional "strain"/functional theory (Smelser), 2) resource mobilization (Meyer & Zald) and, 3) the French school (Touraine, Castells) emphasizing the "new" social movements (anti-institutionalism).

The four types of social movements Hannigan describes are analyzed using all three types of social movement theory but he emphasizes degree of anti-institutionalism (following the French school premises). These four types are: social liberation movement, revolutionary movement, cultural movement, and professional reform movement, and his typology is indicated in Figure 2, shown below.

Figure 2. Hannigan's critical appraisal typology of social movements.

		<u>Emergent Group Identity</u>	
		High	Low
<u>Emergent Anti-Institutional Awareness</u>	High	Social liberation	Revolutionary movement
	Low	Cultural movement	Professional reform movement

(Hannigan, 1985, 450)

Yet even a broad movement shaped by anti-institutional goals (such as a social liberation movement) needs "connections" to institutionalized elements or an "alliance" with established organizations. This would involve some partial institutionalization of the social movement into organizations and occupations (PISMO processes). This suggests that all successful movements are part of at least some type of an "interorganizational field", or "social web". Social movements may contribute to legitimizing new (emerging) interorganizational fields, sectors, occupations, and industries (Kropotkin, 1975; Rothschild & Russell, 1986).

The need for a social liberation movement to be connected through organizational "operators" (Castells) to mass media, professions, and parties or for there to be an alliance (Touraine) between movement and institutionalized elements suggests that to the extent there are social movement institutionalized jobs there will also be a tendency for those jobs to become "occupationalized."

This case is more visible in the examples of a social reform movement and, perhaps, a revolutionary movement. It is less visible in cultural movements but still salient. There are reasons the environmental

movement is continuing and there is reason to believe the anti-institutional or social liberation dimensions of this broad movement will persist. However, even the strong social liberation aspect of the ecology movement does not mean it is without its links to the dominant Western cultural account of "rationalism." For example, strong links exist between the environmental movement and the social structure and group consciousness of the occupational culture of experts in the environmental sciences. PISMO process occupations stemming from social liberation movements that are links with the system of professions are instituting work regions that may persist.

Studies of social movement institutionalized occupations are, as noted, underrepresented in the occupational structure literature. Studies focusing on detailed job histories presenting longitudinal research on the emergence of occupations are also rare. Of course, many segments of sociology contribute to the study of occupations. As we look at the institutionalization process (through social movement origins), we want to utilize knowledge about the rise of occupations derived from recent theoretical traditions. In particular, the "institutionalist perspective" (Perrow, 1986) will help us.

Within recent institutionalist literature, however, there has been a tendency for the examination of causes of institutionalization to be eclipsed by the study of its consequences (Zucker, 1987). The story of the causes of the nature of extent of change is on the agenda, but understudied (Heydebrand, 1989). The institutionalist literature is also weak in research and theory examining the rise of legitimated fields (DiMaggio & Powell, 1983). Yet change and the rise of new activity is fundamental since placid periods will always be followed by turbulent times - and many of the instituted social movement work roles generate their own work region dynamics during the intervening placid periods. Part of this history is precisely the problem Berger and Luckmann noted: transferring the first level objectivated typifications and habituation to

the next generation, requiring a "second level" of explanations or legitimation. Amateurs made the movements but trained professionals take over the reins (See, eg. Gouldner, 1959, 416 on "itinerants" vs. the "homeguard"). E. C. Hughes (1958) emphasized that

. . . a new occupation emerges from work formerly performed by amateurs, or for pay by people with little or no formal training" (p. 133). He cites three origins of new occupations: technical developments, social movements, and new social institutions (p. 133). He then indicates the likelihood of competition or conflict with other occupations. As mentioned, Hughes observes that new occupations must recruit from existing occupations, leading in time to the emergence of issues about formalized training for the new occupation. This, in turn, eventuates in a progressively more formal credentialing system, placing clear boundaries around the occupation and closely governing entry (pp. 134-135) [As quoted in Blum, et al., 1988, 988-999].

Emerging from action organizations which become "institutionalized organizations" the amateurs routinize the movement charisma. The routinization may take rational-legal forms which institute reciprocal typifications between counter-roles, mediating roles and ancillary roles in an organizational network. This characterizes grants policies with "project managers," or long-term structured funding with "program professionals." Recruitment may become problematic to establish a second cohort without PISMO processes of "occupationalizing," and the rate of turnover within the initial cadre may also need to be studied. Formal systems of credentialling and staffing structures are created. All of this may be occurring within the rise of a new interorganizational field.

Several microprocesses will be seen to be at work in any story of the emergence of an occupation, and this is so for our case study. There are influences of both a specific movement (environmental movement) and the interaction of several social movement types within the, larger, ecumenical environmental movement (Zald and McCarthy, 1980; Hannigan, 1985). Galaskiewicz (1985) observes that "residuals" and "multiplicities" in interorganizational relations are an outcome of complex interactive loops that require the analyst to know the specific history of the emerging occupation system very well. Environmental management roles have

emerged often as key-link roles in sets of organizations. Thus we are looking at a complicated story.

An example of a well-done study of the emergence of innovative school programs and occupational roles that involved an interorganizational network was provided by Rowan (1982). He emphasized the emergence of a "balanced network" (Benson, 1975) among California school departments adopting program innovation. New occupations emerged in tandem with the new school programs. The process of emergence that led to adoption occurred through an "institutionalized", politically balanced network, i.e. consensus among the adoptive units as a "field." Similar types of analyses are needed for emergence of PISMOs, and for the case of environmental occupations. However, examining the history over the last twenty-five years in the environmental example, there needs to be more emphasis not on the articulation of a "balanced network" among existing units (eg., school adoptive units, where the schools were already there), but rather on the emergence of a social movement instituted interorganizational field - environmental management organizations and counter, mediating, and ancillary organizations and occupations.

Social Movements and the Rise of New Interorganizational Fields

In their emergence, social movements have legitimated not only new occupations that are part of interorganizational fields but also new societal sectors (Scott, 1987). For example, in this century, a new sector has emerged with the labor movement. The new "fields" or interorganizational complexes of labor include the U.S. Department of Labor/NLRB & Regional Districts/labor law firms/state regulators/firm and union departments/university-based LIR programs, and so forth. Several kinds of roles may develop in new "fields": link roles, mediating roles, adversarial responses generating new roles, and counter-movement roles. These several roles may emerge within PISMO work regions as new bureaus, as positions being created or altered in existing bureaus, and all of this may interact with new knowledge, making social movement stimulation (of

knowledge) and social movement controls (within organizations and occupations) significant.

Link Roles May Develop

Blum, et al. demonstrate how, in the emergence of the Employee Assistance Program (EAP) "program coordinators", their work included acting as a key link role in between federal money and company and program startups of employee assistance programs. Abbott (1989) noted that, in the US, the state has, in recent decades, frequently undertaken "endless rearrangements of the organizational side of the staffing structures through negative sanctions, incentive systems, and formal regulation." DiMaggio (1983) described this in terms of the incentive system of a federal grants policy for the arts, which resulted in "coercive isomorphism" in structuring the "arts councils" that subsequently emerged. Many examples of such "vertical, non-local, societal sector" grants programs could be given in which key link roles are institutionalized as jobs in the programs. (See Scott, 1983, for general social reform movement, new "federal model" description).

Our case-study asks the question of what happens to these jobs over time? If they can be seen to become occupations, what processes contributed to their "occupationalizing?" One process, it will be argued, is the multiplicity of interactions over time, with resulting sedimentation of social structuring and growth of group consciousness, within interorganizational network - a "societal sector" role emerges, not merely a "grants project manager" as a segmented, bureaucratic "hat." Environmental managers, to a significant degree, "make an (occupational) life" in network relations.

In the mental health and adult education movements similar "complexes" of nested organizations and networks have emerged as "fields". (Such "nesting" can be diagonal, vertical and/or horizontal; see Astely and Fombrun, 1987). In our case-study, we will examine how the WWTP water quality (grants) analyst played out a link-role as key functionary in the

large dollar, program relations of a complex interorganizational field of municipalities, WWTP roles, contractors, public officials, EPA, and so forth. Similar rises of interorganizational linkages into distinct "sectors" has emerged with civil rights, consumer movement, health and safety, women's, and other movements. In all these cases "occupationalizing dynamics", potentially built-in to any key link role, may be relevant for subsequent development of social structure and group consciousness. One way PISMO roles develop "occupationalness" is through interaction with mediating roles.

Mediating Roles May Emerge

The labor movement, interorganizational field gives some clear examples of the emergence of mediating occupations. Here the institutionalization of national labor relations roles in such federal agencies as the Labor Department included occupations such as "arbitrator" and "mediator" (eg., in the Federal Mediation and Conciliation Agency). These roles require years of experience, training and skill and clearly offer examples not merely of "jobs" but of "occupations" with accretion of social structure and group consciousness. Indeed, careful monitoring of the character of social structural contacts and consciousness is an important part of the "program professional" orientation that the resolution of issues regarding movement, professional, and organizational controls requires in this key, mediating occupation (see Fossum, 1988; Kruger, 1982). Other examples of mediating roles might include educational facilitators, civil rights mediators, consumer mediators in law and government, arms negotiators, merchant bankers and merger spokespersons, political negotiators, religious umbrella organizational mediating roles, mediating roles as brokers in ethnic coalitions, neo-corporatist political mediating roles, and so forth. The major focus of studies of mediating roles instituted by social movements might be in locating both processes that initially establish such positions and processes that help them emerge (and sustain them) as occupations. Of course, it is often the case

that in the web of societal conflict and group affiliation (Simmel, 1955) PISMO roles will interact with adversarial roles emerging in established organizations.

Adversarial Responses from Established Organizations and Institutions May Create New Roles

Again, the labor movement provides a clear example. In response to the (partial) institutionalization of labor relations into sets of social movement, federal government, and state government jobs and occupations based on the legalization of collective bargaining, the business organizations created adversarial response roles: jobs and occupations emerged in personnel and labor relations departments as analysts to prepare the company for bargaining, resistance, and decertification campaign consultant roles. The European model of neo-corporatism has probably gone the farthest in this emergence of elaborate sets of roles: As Wilensky once put it, in describing the six-to-eight sided bargaining in smoke-filled rooms in the labor relations of neo-corporatist arrangements, the adversarial relations are something like "Get your experts, bring your statistics, and we'll meet at dawn!"

Other examples can be cited: Traditionalist curricula-advocate roles have emerged in response to adult education; organizations and occupations have been emerging around the "politically correct" media coverage of "multiculturalism" and affirmative action; anti-feminist organizations and roles have sprung up; and, of course, many political, ethnic and religious establishments have generated new roles in adversarial response. Focused study of such adversarial responses for the environmental movement have been provided by Schnaiberg (1980) and Morrison (1972, 1973).

In general, the import of the rise of resistance to social movements by adversarial responses in established organizations is that both the social movement and the established organizations and occupations may alter in an interactive, dialectic of response and counter-response over

time. Unravelling such feedback loops can become difficult historical tasks - but such careful study would be necessary to isolate and assess the many separate processes at work. Of course, it is not only established organizations and institutions that typically respond to social movements - there is also the initiation of countermovements.

Describing social movements in general, Hannigan (1985) notes how Touraine builds in analysis of responses to social movement as altering the nature of the social movement. There is a parallel on the middle-range level of how a type of work changes in response to resistance in its build-up of social structure and group consciousness. As a job becomes an occupation how does the interaction of the emerging role with (also emerging) counterroles, mediating roles, and ancillary roles help lead to "occupationalizing"? Responses to social movement institutionalized occupations and to changes in the nature of occupations due to interaction with conditions created by counter-movements change the conditions for "occupationalizing."

Counter Movements May Emerge Influencing Social Movement
Institutionalized Occupational Labor Market Conditions

Lo, (1982) has described the rise of conservative counter movements which have arisen to oppose leftist movements. Many jobs instituted by social movements and countermovements can become institutionalized as "organization-sets" of counter-role. In these cases, the counter-roles interaction layers the initiating PISMO job with accretions of social structure and group consciousness built up in interaction with the counter-role. For example, in the interorganizational field of environmental management, counter-roles embodied in emerging occupations, such as private consultant roles, engage in long-term work activity in relationships with the grants policy project manager role: the extent of "negotiated order" between these occupations, or how the occupations shape each other, is touched on in our study. Job behaviors may be partly transformed toward "occupationalness" by such interaction. Of course, the

new emerging counter (or partly ancillary) role of consultant was established as an entrepreneurial response to the new bureaus that were created by the environmental movement: EPA and the DNR grants section.

New Bureaus May be Created

As Hannan and Freeman have noted (1977), emerging organizations suffer from the "liability of newness." When social movement action organizations institutionalize as an "origins effect", when social-movement-instituted interorganizational fields involve new link organizations and roles, when establishments create new organizations or roles in adversarial response, and when counter movements institutionalize counter-action organizations, development of new units, bureaus or organizations may be a more certain survival tactic than reorganizing existing bureaus or units.

This can be seen in the proliferation of "alphabet soup" organizations in the reform movements of the 1930's Great Depression; in the 1960's Great Society programs; in the various recent social movements and responses from establishments and counter movements. As Scott, Meyer, and Rowan all emphasize the building blocks of organizations are institutionalized and available (as rationalized myths) able to easily be put together, with a "little bit of entrepreneurial energy." The focus in examining new units, new bureaus and new organizations within large divisions should be, for our purposes, on the manner in which this phenomenon builds-up or in an interactive way facilitates, maintains (or thwarts) "occupationalness." Blum and associates have some discussion of this, describing the early entrepreneurial role of amateurs-becoming-professionals in the EAP program coordination role. Bucher and Strauss also note the "conflict processes" often involved as medical specialties carve out subspecialties.

Water quality management was a specific occupation emerging out of the environmental movement. But occurring as it did in the 1970s,

environmental management occupations were also influenced by a period of heightened public sector activity. Bureaucratic organizations do not just carry out policy, they also make policy (See Rueschemeyer, Evans and Skocpol, 1985). Parts of the environmental organizations policy agenda has been to make their single-media jobs more into cross-media planning occupations (GAO, 1988), to make the institutional shift from law and regulation to comprehensive planning roles (Veissman, 1988, 583). Also salient for the occupationalizing of the initial water quality cadre or cohort were the quality of work life movement, the adult education, and perhaps other movements relevant to their "origins effect." The cluster of social movements intersecting within the lives of that first cadre of environmental managers (especially their experiences during the years 1968-1973) may make senior workers in the environmental management field a generational cohort. The fact that this process is occurring primarily in the context of government bureaus needs to be taken into account.

Positions in Existing Bureaus May be Altered or Created

While entirely new organizations, units or bureaus (for example, the EPA or NLRB or EEOC or OSHA) might be formed through social movement influences, it is also the case that existing bureaus or divisions often alter existing patterns or create new ones. All incumbents of environmental management jobs have lived through frequent alterations and reorganizations of their work region. The "origins effect" of new positions in existing bureaus would be expected to be correlatively smaller in power and resources, but might be crucial. The focus in examining the emergence of positions in existing bureaus requires careful job histories that can isolate the processes involved. The Blum, et al., study of EAP program coordinators is a model of a single position being created in an existing departments (eg. in personnel departments) that later became new units. The Blum, et al., study is also useful in tracing the "characteristic work activity" and sense of "mission" and "methodology" which became the emerging occupations ideational and

normative structure. On the basis of these ideas and norms of what the occupation was Blum and associates were able to create a composite measure of when the position had become an occupation. Examining how social movements stimulate new knowledge which may lead to new specialties may help in constructing measures of threshold of when a subsociety (or cohort) with a subuniverse (or "segment") of knowledge (or work jurisdiction) has become an occupation.

Social Movements May Stimulate the Growth of Knowledge Leading to New Specialists

We have indicated that social movements signal new possibilities within a social order and often may generate new occupations; that the "new" and the "old" social movements include processes through which occupations emerge; that the particular style of a social movement is influenced by historical conditions (time and place) and may involve a distinct cohort; that conditions of success for a social movement include connection or alliance with institutionalized elements which may mean social movement generated occupations are part of an "interorganizational field." Many recent social movements and their reform occupations have also been influenced in their development by an interplay with science and the growth of knowledge. Eyerman (1989) stresses the interplay of the development of social movement and the development of science. This seems central to the case of the ecology movement (Cohen, 1983; Habermas, 1982, 1990; and topical references of Herber, 1954 and Carson, 1960).

There has been growing scientific knowledge and technical abilities of measurement that relate to environmental management, in general, and the wastewater pollution control "industry system" in particular. This growth of knowledge relates to internal "work activities" and "methodology" (Bucher and Strauss, 1961) in this job jurisdiction which may influence "occupationalness." Although the build-up of social structure and group consciousness contributed by social movement, cohort and new interorganizational field interactions are clearly important,

growth of knowledge in the area has also influenced the occupationalizing of this position.

We might ask first, briefly, what changes in the knowledge base of the environmental movement have occurred? In the state civil service departments of natural resources community assistance planning has been influenced in the past by the "older" social movements (see Wallerstein, 1988) connected with public works, urban reform, and (public sector and/or "growth coalition") public planning in a way that led to a general "conservation and engineering" occupational culture. However, the "newer" (post-1968) social movement ecological sensibilities have tended to emphasize a decentralist, more theoretical science-based, and lifestyle issue value complex in an "environmental" occupational culture (See Simmons, 1990), which may reflect a broader paradigm shift in societal belief structure, from a technological perspective to an ecological perspective (Dunlap & Olsen, 1991).

This "paradigm shift" within environmental engineering is ongoing but distinct and has, as a "segment" conflict, helped to make the field into a "profession in process." The general impact of the changing social movement has shifted the focus in the growth of knowledge less toward engineering and more toward ecology, stimulating newer, more "ecological" specialties which, in turn, in a dialectical fashion act back upon the emerging "occupationalness" of environmental management. In general, we may find interactive, additive, multiplicative and dialectical processes at work, yet in general the insights on "paradigm shift" raise the issue of whether PISMO processes contribute to a reproduction of form (general rationalizing process) or an increase in substantive rationality (Alexander, 1985; Habermas, 1990). Does the emergence of a conscious social group accomplish substantive goals? Have the water quality management roles contributed to improvements in water quality? What are some of the factors affecting clean water management in terms of how, when and under what conditions individuals become an occupational group?

If we view, as we have, occupation as work that has some structure built up around it and is characterized as a conscious social group, we can recognize in models of occupational consciousness a key theoretical grounding. Social movements have always been sources of changes in consciousness. Bucher and Strauss (1961) and Zald (1988) have noted that organizations and "work regions" in the division of labor have social movements within them. These internal build-ups of social structure around work activity also involve group consciousness that helps to "occupationalize" those jobs. External social structure sets opportunities and constraints on "occupationalizing."

Our case study of an emerging occupation examples both the buildup of social structure and increasing degree of consciousness as a work-defined, social group. The environmental manager roles are a mixed new form - a new form that may be characteristic of new social movement occupational forms. To place these roles in the context of other social movement-based occupations, we will review a variety of social movement institutionalized processes of job creation and the emergence of occupations. As we look at several social movements, we wish to keep in mind Wilensky's injunction that we need both detailed job histories and a systematic, comparative approach to begin to understand the range of new, mixed professional forms. Sometimes these new, mixed professional forms are an outcropping of prior positions. The social movement influences the pre-existing type of work not only in the growth in new knowledge, but in a more general transformation of the prior position.

Social Movements May Alter or Transform a Pre-Existing Position

When social movements influence prior positions they may change more than the occupational title and the knowledge base of that type of work - they may add a new resource base and new dynamics to fundamentally change the conditions under which the altered, prior position may now "occupationalize." In the case of water quality and wastewater treatment there was the prior position of the "sanitary engineer." This work role

had a fifty year history in the civil engineering tradition, but was hampered by its association with a broad, abstract work jurisdiction. While the prior positions duties were said by the American Society of Civil Engineering to include air and water quality, toxics, waste, and epidemiological aspects of health, the actual work jurisdictional power was limited. As our study will demonstrate, with only a small number of persons in this role, and in the historical context of national and local water policies that emphasized development, growth and coordination prior to the 1960s environmental movement, this pre-existing position was limited in its ability to "occupationalize."

In general, when social movements influence prior positions, a more complicated story may emerge which requires careful sorting of different influences on continuity and change. But the case of environmental management, and the alteration of the "sanitary engineer" into the "environmental engineer" offers a good example of how social movement influences can alter prior positions, infusing them with new potentials to expand and change their work jurisdictions.

Each social movement and any institutionalized occupation associated with it will have its own specific historical character. We have indicated what some of the processes are in how social movements create jobs, and indicated that a process of "occupationalizing" jobs occurs under certain conditions and through certain processes. Although our discussion remains general, we have indicated some elements of the natural history of environmental management that will bear on our detailed job history, and that indicate how, when, and under what conditions a labor market position may undergo the build-up of social structure and group consciousness associated with becoming an occupation.

The general theme of the conditions for group consciousness especially deserves more study since the argument that increasing individualism is due to diverse modern (Coleman, 1990) and post-modern (Hunter, 1988) conditions does not suggest that all instances of

substantive rationality are due entirely to individualism. The level of collectivity and group consciousness has a role to play - basically, to the extent that we are substantively rational it must be through an interaction of individual biography and the collective history. The contributions of group consciousness, as exemplified in unionism and professionalism, are standing models of consciousness. We assume that both of these phenomenon are of importance to, and related to, the theme of substantive rationality. Social movements generally have affected consciousness. When social movements have an impact on "professions in process", the mixture of social controls is unique. A comparative history of this phenomenon would be a valuable addition to this general task, but is beyond the scope of this study. However, we can ask through a brief review of other social movements what indications there are of the conditions for "occupationalizing" social movement instituted jobs?

EXAMPLES OF SOCIAL MOVEMENT INSTITUTED TYPES OF WORK

Adult Education Movement. This movement has had many sources emanating out of the growth of education in the 1950s and early 1960s, and spread by the rise of new institutions such as the junior college, the community college, and the evening college. Prompted by some measure of increased leisure, by a faster pace of technological and social change, and informed by a new appreciation in the social sciences for adult learning, the contemporary version of this movement carried the "revolution by education" theme into the practical work-a-day training, personal skills and development, and leisure needs of adult learning. New roles were emerging in new units, and occupations formed with support structures of "adult and higher education" departments in universities and new program roles in the community colleges, technical and business colleges. This movement has also entered the private sector through growing business appreciation of the role of training, human resource development, organizational development, and organizational culture. As a

movement, it has undergone steady increase in influence and a stabilization of many roles.

Adult education occupationalizing includes many processes specific to growth of knowledge, specialization and the division of labor, and social movement sources of emerging occupations. Institutional perspectives have contributed to the study of current conditions relevant to adult education since schools, community colleges, evening colleges and community programs are areas of highly institutionalized organizations (eg., Rowan, 1982) and highly bureaucratized labor market fractions (see Edwards, 1979 for a description of the part-time instructor).

Civil Rights/Affirmative Action Movement. This movement, also originating in the 1950s and early 1960s, led to federal, state and local laws which established specific regulatory, watchdog, and program roles, e.g., civil rights commission enforcement agents, federal staff roles in the Labor Department under OEO and EEC, and many state positions. Also many voluntary organizations emerged, such as Legal Aid and the Urban League. This movement has come under hard times with the fluctuations in the economy in the 1970s and 1980s and currently is at a seeming impasse or crisis point. It may be a movement in which institutionalized occupations will encounter a lowering of the "level of confidence in the context" for role incumbents. Civil rights occupationalizing has included many processes specific to egalitarian and categorical group demands of PISMO shifts in the occupational structure, raising the complexity and importance of societal staffing systems (Abbott, 1989; Mondy & Noe, 1984; Gery, 1977).

Consumer Movement. This movement was probably strengthened by the general set of movements occurring in the 1960s and by the Ralph Nader organization in particular (indicating the importance of charismatic individuals in social problem definition). As many have pointed out, the centralization of capital in large companies and these claim to being

essential to society's well-being, has encouraged a tendency for the people to turn toward government for protection and to solve problems (Edwards, 1979, 161). This tendency has made consumerism one of the major movements in recurrent waves of increased influence around issues of product safety, labeling, quality, and, in recent years, especially in the fields of nutrition, diet and health. Many federal, state and local consumer units have proliferated; voluntary organizations have stabilized and business firms established around consumer issues. This appears to be an occupational field which will receive continuing pressure for existing and new occupations.

Feminist Movement. This movement has led to the establishment of centers, programs, clinics and voluntary organizations that did not exist prior to the 1970s. Many new jobs have been instituted and it remains to be seen how many of them will undergo "occupationalization." Current diversion with the issues of abortion rights and the seeming slow progress of the feminist revolution in many areas should not deter attention from the potential for more build-up of social structure and group consciousness at the "front end" of feminist occupation creation. This is a movement that has affected staffing in many other regions in the division of labor.

Health and Safety Movement. In some ways, this movement is not separable from the labor movement, in other ways it has taken off strongly as a movement on its own. Concerns about health and safety have led to new organizations, new units in organizations, and expanded government roles at all levels. There have also been new organizations and new units around health, safety and nutrition in the private sector. As indicated in the Zald (1988) review, conditions exist for the continuation of this movement and its types of work. This field seems particularly well-suited to exemplify transition from jobs to occupations since it combines professional "calling" with social movement "missionary" ideology and

newly emerged organizational "careers" based upon a growing "region" of abstract knowledge as cultural currency for "professions".

Labor Movement. Over two centuries this movement has engaged in making not only ideological levels of articulation (Thompson, 1964) but also institutional levels of articulation (Held, 1984). The labor movement has led to staffing structures in unions, and many other roles. At the federal level many new roles in the Labor Department emerged with the height of the US labor movement in the 1950s. This movement found new allies in the 1960s and appeared to provide potential models for substantive social change around the world in the 1970s. Part of this change had included the rise of many public sector roles (and institutional complexes) that were "professions in process." However, due to internal weaknesses in its revolutionary and marxist versions (Claudin, 1976; Conrad and Szelenyi, 1979), and the fall of the Keynesian coalition (Gold, 1977) weakening its social democratic and neo-corporatist version (Wilensky, 1975; Held, 1984; Schmitter, 1982) the fate of labor in the emerging world economy of the 1980s and 1990s has seen this movement has come upon hard times (Lipset, 1986; Edwards, 1987). Partially due to difficulties in organizing due to the changing composition of the labor force (Fossum, 1988) and to the falling market share of their US based manufacturing corporations, the US labor movement-institutionalized work roles, jobs and occupations have been "downsizing" along with their firms "downsizing." There remain questions as to whether US industry can eliminate the bases of adversarial labor relations by instituting gainsharing and job security in "neo-American plan" programs. If this institutional transition does not work, the bases in the social structure for a new wave of organizing around adversarial relations could occur (Piore, 1985). If this institutional transition does (at least partially) succeed, new occupationalizing could occur within a large and growing set of practitioners in organizational development, training, "jointness", and other newer roles.

The labor movement has given all the recent movements the model of an occupation that is a mixed form of professional, organizational and social movement controls: the labor staff expert. As Wilensky noted, the orientation of incumbents of this role involves a mixture of professional service, careerist (or "organization man"), and missionary. A social movement instituted occupational role is "missionary" in the sense that it is:

. . . Oriented toward some abstract concept of a social movement; highly identified with an outside political or religious-political group, (the missionary person) sees the organization as vehicle for social change fitting private goals - goals derived from past or present participation in social movement (Wilensky, 1984, 151).

The roots in the social structure for the labor staff expert role are clearly in labor unions as a social movement. (See Touraine, 1986 for an interpretation of unionism as a social movement). To some extent

. . . the role is not clearly defined (new, because organization is new, new unit in established organization, or organization has diffuse purpose), provides change for (the) innovator (Wilensky, 1964, 151).

Of course, the labor movement has been the earliest model of social movement instituted jobs but there are many other examples. Mental health, for example, has provided a general model of self-help, group support and moral treatment approaches that has contributed to social movement occupationalizing.

The Mental Health Movement. Many innovators in the mental health field have instituted new, emerging roles in self-help, out-patient clinics, group therapy, and adult-education related programs. However, there have also been structural and social context reasons for the fluctuations and advancement of the mental health movement. A brief review of the social context of changing perspectives on mental health may help focus on the social knowledge conditions for role developments.

In the early 1800s the prevalent social perspective worked at a local or community level and mores included a way of working with people that called "moral treatment." The aim was, over time, to help people work

out their difficulties in a neighborly way, sometimes involving the use of retreats. The conditions of this form of treatment were local, small town and community-based. However, with the massive immigration of the late 19th century under the pressures of rapid urbanization, social perspectives regarding treatment shifted in concepts from "moral treatment" to "insanity." Now the urban waves of immigrant workers, when evidencing difficulties, were diagnosed not in "moral" terms but in "biological" terms: they had an incurable, biological condition called "insanity" and the only solution was to put them away in prison-like hospital wards in low-cost warehousing facilities without interaction with treatment roles at all aside from basic nursing. After World War I, another shift in mental health perspectives and in types of work occurred. The many returning middle-class soldiers with shell-shock stimulated the "mental hygiene" movement, which was aided by the advent of radio and early dimensions of the adult education movement. These "middle class" events also stimulated new ways of interacting with persons in a shift toward self-help, supportive roles, and "professionalizing." Some roles developed in interactional treatment which were developed in psychoanalytic, transactional and gestalt, physical-based therapy, and self-help and group based therapy. Many amateur roles also developed. Later, in the 1950s and 1960s as part of the adult education movement, mental health movements received further impetus as many more new roles, types of work, and occupations arose.

While this brief history of the mental health movement does not take us very far, it suggests that the background structural and associated changes in social context and social perspective were influential in conditioning shifts in the social movement, and in conditions for occupationalizing. Recent trends suggest that the mental health movement has basically developed as an arm of the adult education efforts as a movement toward a type of social-movement instituted "occupationalness" that includes many currents but may be characterized by a "health"

orientation closer to the "moral treatment" of the early 1800's. This includes "health" facilitation roles (prevention training roles, self-help leaders, out-patient counselors, school and adult teachers or psychologists, and many program roles, along with the more traditional professional roles associated with various styles of doctoral emphases in psychiatric training as a form of medicine. In brief, the social movement impact on psychiatry has created many new, mixed-form roles which have included professional, organizational, and social movement controls aimed toward goals similar to the adult education movement. Self-leadership and family peace are important goals of the mental health movement, but recent conditions and new types of complex world tensions have led to somewhat of an impasse for the contemporary peace movement.

The Peace Movement. While there have been movements for peace prior to WW II, perhaps the advent in the 1950's of SANE and the post-World War II concerns about nuclear holocaust and the technological scale of world war have made conditions for permanent, institutionalized peace organizations more viable. Aided by the expansion of higher education from 6% of the adult population in the 1930's to 50% in the early 1960's, the recruits for peace organizations increased accordingly, especially during periods of draft. The Vietnam war and the draft in the 1960's saw the institutionalization of many new organizations and created new roles at the local level (church, voluntary organization), the national level (federal agencies concerned with disarmament, national clearinghouses for peace organizations, etc.), journals, commissions, and international organizations including an expansion of UN units. Occupations have emerged in universities with centers for the study of conflict resolution and peace, and there has emerged a body of knowledge on the subject that links up with safety and health, environmental, mental health, and feminist movements.

Political/Ethnic/Religious Movements. These movements have provided the subject matter for much work on movements, and some of the classic questions in sociology about occupations have surfaced from the study of these long-standing bases of social action. Each movement leads to staffing: Political movements develop parties and government agencies and programs; ethnic movements may establish nation-states, self-help organizational roles, voluntary associations; religions establish institutions such as churches, voluntary organizations and often government-related programs or roles.

Zald (1988) has noted that, in the US, since the Progressive period of the turn of the century, it has been hard to separate social movements from political pressure groups due to the proliferation of associational forms (organizational capacities) available and prevalent in the US. That is, in the US, social movements often become transformed or take an "organizational" form. This phenomenon may have been happening with ethnic and religious movements. Examples of political movement institutionalized occupations include the humanitarian reform movement which lead to welfare occupations, correctional officers, nurses, and many other roles (Wilensky and Lebeaux, 1958).

Urban Reform Movement. The urban reform movement of the Progressive era in the US occurred at the turn of the (last) century and included the institutionalization of public planning, city managers, civil engineering, professional civil service and "progressive government" occupationalizing. Continuing waves of urban reform have led to successive categories of emerging occupations: The 1930s included public housing programs, the 1950s urban renewal, the 1960s innovated neighborhood youth corps and other community movement-related urban reforms. Suffering neglect in the fiscal crises of the cities in the 1970s and 1980s (Hill, 1980) urban social movements have produced jobs and occupations. As an example of a "profession in process" the urban advocate planner (Ross, 1975) stands as a model of a social movement instituted occupation. Contemporary work

includes studies of roles that emerge in community responses to disasters and economic and environmental crises (Aronoff, 1991; Schnaiberg, 1991).

Summary

Our brief review of several social movement institutionalized occupations raises the issue of different types of professions. Each of these types of social movement institutionalized occupations represent a new form of professionalism different from the classic models of doctor, lawyer or architect. Wilensky emphasized that the newer professions look less like the old, established professions and more like a "mixed type" of resolution between (free) professional, (careerist) organizational orientation, and (missionary) social movement influences. The nature of this role orientation resolution is different for historical reasons due to differences in movements, organizational context and the particular nature of each type of knowledge as a "profession in process." However there may be some similar "occupationalizing" processes occurring in different types of social movements (social liberation, cultural, revolutionary, and reform) and there may be different extents of two or more of these different types of social movements composing one particular social movement.)

Social movements can act as a type of social control for occupational and organizational behavior (Wilensky, 1964; Bucher and Strauss, 1961; Ross, 1975; Blum, et al., 1988). In his explanation of the emergence of formal organizational structure in the case of schools Rowan (1982) showed a "balanced network" beginning to occur in pre-existing school departments, as social movements around certain educational programs were pushing for adoption of their ideas (which led to new units and new occupations). The "permitting" system in a "mandated network" of guidance and compliance for WWTP grants also follows a pre-existing set or pattern of units (a bureaucratic regulation system and roles at state and federal level). But in environmental management we are also looking at the historical context of a large, newly emerging interorganizational field.

In the school situation much of the context has been institutionalized. The social movement pressures to establish permits and to enforce them widely replaced earlier patterns of limited application of permits on the state level and much less enforcement. It is this social movement story which distinguishes the organizational context of schooling (already highly institutionalized) and environmental management (a new, emerging social movement institutionalized interorganizational field).

Rowan argued that, as highly institutionalized organizations, schools exhibit considerable dependence on the ritual element, where technical activities are left largely uncoordinated (unit autonomy) and external, environmental relations are closely managed through attention to "rational myths" (credentials, mimetic practices). As organizations in highly institutionalized environments, schools survive by emphasis on isomorphism (adapting waves of new "rationalized myths") (Meyer and Rowan, 1977, 1982). While the "permit-system" may encapsulate current water quality action in such "rational myths" to an excessive extent, what seems real in the case of environmental organizations of clean water managers, over the longer range, is the social movement, and the "drinkable" and "swimmable" water standards driving that social movement, not the "institutionalist" code (or rational myth) of the permit process. In this sense environmental management has been correctly labeled as a more technical sector (versus education, which is a more institutional sector). Meyer and Scott (1983) indicate the differences between "societal sectors" along the institutionalist versus technical dimensions. In general, institutional sectors are characterized by the elaboration of rules and requirements to which individual organizations must conform if they are to receive support and legitimacy from the environment; technical sectors are those within which a product or service is exchanged in a market such that organizations are rewarded for effective and efficient control of the work process. Of course, various combinations may be observed, as indicated in Figure 3, shown below.

Figure 3. Meyer and Scott's institutional versus technical "societal sector" typology.

		<u>Institutional</u>	
		High	Low
<u>Technical</u>	High	Medical Care Sector	Retail Goods Manufacturing Sector
	Low	Educational Sector	Personal Services Sector

(Meyer and Scott, 1983)

As environmental managers work with various residences, industrial facilities and others that send their wastes to municipal treatment plants and must meet certain minimal standards, it seems important to emphasize, however, that this "technical" dimension carries with it a strong social movement "origins effect". The permit system is also highly institutional in its origins and in the ongoing build-up of social structure and group consciousness around the water quality standards. Some of the "institutional" dimension accrues to a "technical" sector because it is a large dollar program involving construction, municipalities, taxes and bonds, and intergovernmental relations.

Municipal wastewater treatment plants (WWTPs) must also, of course, meet discharge standards and it is in the rebuilding and upgrading of the municipal wastewater treatment plants and drains that the story of the clean water manager role in cleaning up the streams, rivers, lakes and ocean shores is told.

How do the different types of social movement create such "mixed type" of work? Are there any processes in common characterizing the way in which many of these social movement jobs become emerging occupations? One set of processes is internal (lying within work regions), another set of

processes is external (lying between work regions and the nature of socio-cultural links) (Abbott, 1989).

The Organizational Context

In a typically well balanced and thorough review in 1964, Wilensky assessed the then current emphasis that the "new forms of professionalism" would involve primarily an interpenetration of organizational controls and professional norms. Characteristic of the early 1960s, the concerns at that time were around what would be the fate of professions with so many proliferating types of would-be professions? And there were concerns with conflict between careerist (organizational) versus normative and colleague control (professional) orientations within so many new organizational contexts of professional work.

In our review of the subsequent twenty-five years of social movement impacts on "professions in process", we noted the tendency for new organizations to emerge (Meyer and Rowan, 1977; Scott, 1983; Scott, 1987; Heydebrand, 1989). Looking forward, as social commentators of his time worried about the fate of professional norms versus organizational controls, Wilensky argued that "on balance, the organizational threat to professionalism, to the extent that it is a threat, is the one that will grow in influence." (Wilensky, 1984, 155). The analysis was that, in the new structural forms (of professions), the older "free" professional pattern would be replaced by "mixed forms of control" in the newer, marginal, or would-be professions. For Wilensky and for many others the definition of profession involves a "service ideal" and colleague control. As Abbott (1989) points out, it is a form of work control located in trained individuals rather than in organizations (see also, Mintzberg, 1983). The professional occupation is seen, in this view, as a labor market position of individuals and their colleague group (this is discussed as an "occupational labor market", or OLM, by Berg, et al., 1981). The classic professional jurisdiction was not an "organizational" position and the professional service ideal was threatened by

organizational controls. Social movement goals and context can also act as a control.

However, there were also some professional and organizational forms in which there were incumbents who held strong "missionary" role orientations carrying goals taken from the goals of social movements. Such missionary goals could contribute to innovative and occupationalizing strategies. It seems that Abbott (1989) may have underestimated the distinctness of work controls located in such "mixtures" of social movement, organization and profession.

Other theorists of organization such as Scott (1983, 1987) also generally view organizations as the "preeminent" type of institution in the modern period (see Zucker, 1986). That is, instituting organizations as a "strategy of action" has become a persistent way of ordering action through time as a model of societal processes. In Scott's five "rationalizing processes" model, instituting organizations and occupations, as a strategy of action happens at the ideological, the organizational and the individual levels as developmental features of general social process. He notes that in this general process:

(1) An area is identified for rationalization; (2) forces are mobilized calling for reform (mass-based organizations develop, existing organizations activate, newer associations are formed); (3) professional groups have interests in reform (their job is to initiate and help shape such reforms); (4) Reform efforts are viewed as resting on a rational and scientific base that must be extended. (The promise is held out that the area of concern can be reorganized and put on a more scientific basis). Calls are made for more research, for more and better trained personnel, and for the more efficient organization of services; (5) The practitioner knows what is in the best interests of the client, that is the professional concept of a client's needs is based on some definition of homeostasis, departures from which require attention (Scott, 1983, 118). (See also, Abbott, 1989; Friedson, 1986; Bordieu, 1988; Ritzer & Walscak, 1986).

Scott argues that once an area has been "opened up" by these processes it becomes easier to legitimate new professional specialties, occupational roles, and types of services; and older professions explore ways to expand their services to the new area. Rationalizing processes

"let the light of legitimacy shine in," encouraging new organizational ventures to grow (Scott, 1983, 118). However, as Berger and Luckmann's (1967) treatment of social construction emphasized, the "first order" objectivations (typifications and habituation) needs a "second level" of legitimation to "explain" what is being passed on through socialization to the next generation. In this constructing of "the light of legitimacy" there is not only the role of the general rationalizing processes as institutionalizing (legitimate) form, there is also the role of that level of consensus around the social movement goal.

In understanding "rationalizing and organizing" processes the historical context in which they are occurring is crucial, highlighting their distinctive features. The particular conditions present at the time of their unfolding may, as Stinchcombe argued (1965), mean that occupations, organizations and interorganizational sectors founded at a particular point in time tend to share certain characteristics as an "origins effect" (Robbins, 1990).¹⁰ Whether it is consensus around forming a "balanced network" in school program adoptions or consensus around building-up and sustaining a new societal sector in environmental management, build up of social structure and group consciousness must have contextual conditions that sustain the capacity of "occupationalizing" past a certain threshold after which an occupation has emerged. Sustaining the capacity to make a job into an occupation suggests both collective action and a resource base. It raises, however, the question of when you know whether you have an occupation.

SECTION THREE: "OCCUPATIONALIZING" THE JOB

In his recent article on the nature of the "new occupational structure," Abbott (1989) sums up the definitional problem of "what is an occupation" by noting that an "occupation" is different than a "job." In an occupation, to repeat, there has been a build-up of social structure around the job and build-up and increase in group self-consciousness. We

have given some general examples of this in our review of social movement institutionalized occupations.

How do you Know an Occupation Exists?

Blum and associates (1988) provide a specific methodology for measuring when an occupation has emerged. In their study they note the social movement origins of the Employee Assistance "program consultant" roles, which emerged at first as dedicated amateurs working in the adult education, the mental health, and the alcoholism-as-a-disease movements. They tell the story of the build-up of social structure and group consciousness (described at a theoretical level by Abbott), and present some methodological considerations (measures) concerning organizational commitment, occupational commitment, calling or sense of mission, peer evaluation, occupational autonomy and social value of job to help measure or determine when a type of work has become an occupation.

An important earlier work by Bucher and Strauss (1961) examined medical pathology specialty journals and, utilizing interviews and other data, they were able to contribute a theoretical concept of social movement-like segments within types of work that carve out new occupational territory. Ross (1975), as mentioned, shows a "profession in process" in the emerging role of "urban advocate planner," a case in which emerging urban and community movements institutionalize an advocate role. These and other studies require us to sort out not only occupational and organizational theory, but also social movement theory, and to construct careful detailed histories, to search for the processes, conditions, and contexts related to the build-up of social structure and group consciousness.

Social Structure and Group Consciousness

The organizational ecology literature presents studies that emphasize the importance of the founding of organizations. At such times that organizations form there are imprintings from context, goals, and

forms and processes known as the "origins effect." In our case of the clean water manager the early initiation of the new organizational role came with new and more carefully specified behavior in monitoring complicated water quality standards. The process of more carefully specified behavior and work performance measures was noted by Bucher and Strauss (1961) as part of the articulation of a newly emerging profession's mission. However, we want to keep in mind the sources of processes of "carefully specified behavior and work performance behaviors" can be social movement influenced.

Wilensky (1964) also reviewed the issues of new job jurisdiction. In the water quality analysts' job description, the granting agencies (EPA and state) built in careful policy and "steps" for grants and loans applicants which became the WWTP grants "project managers" work role. The treatment plant officials, municipalities, engineering firms, and consultants follow this EPA plan. Clean water management was an "environmental movement innovation" that specified not only a policy outcome but established the occupational role of project manager. In it's "origin effect", this founding of the work role jurisdiction may have laid the foundation not only for the work role but also for the growth of social structure and group consciousness.

Career Literature and the Question of "Orderly Career"

One aspect of the growth of structure is the development of the professional career. As we have noted, in his well-known "Professionalization of Everyone?" essay, (1964), H. Wilensky, notes that the issues of an emerging occupation revolved around a "jurisdictional claim." In their analysis of the emergence of segments, Bucher and Strauss note that, in their "early phase", a segment articulates a "service mission" as an ideology. Wilensky argued that "the service ideal" is the master norm of a profession. The degree of adherence to the "technical service ideal" then becomes a major indicator of a profession.

Another more purely labor market micro process involves the general sociological model of professionalization. Here water quality occupations move from the collective behavior of "the movement" to (partially) institutionalized forms along with continuing movement behavior which may remain (or ebb and flow) on a somewhat different, less institutionalized, pattern and amateur status. There were dedicated individuals in such amateur situations (with lower social structure) in the early lobbying and consultation phase of water quality issues (Caldwell, 1989; Viessman, 1988; Dersch, 1990). A change in consciousness from within social movement goals to include, or build up, "occupational consciousness" also occurs as jobs are formed. As the build up social structure occurs problems around recruitment, training, selection and "career" arise.

Professionalizing Literature as an Example of "Occupationalizing"

Theory in the sociology of professions seems to focus currently almost exclusively on the market power of a professional occupation, and to see the emergence of professions only in this power or "institutionalist" model, however this model often remains highly abstract, often missing historically specific contexts. The sociology of occupations could use more detailed studies of "professions in process" (Ross, 1976; Blum et al., 1988). Studies of the new social movements are suggesting that Weber's concern with the routinization of charisma will continue to contribute to both "discourse" and "structure" (Hunter, 1988) in the "occupationalizing" process. Professionalization stands as one major model of such occupationalizing.

The Process of Professionalization

Wilensky outlined five steps that could be discerned from an examination of detailed social histories of emerging professions. These steps were: 1) start doing fulltime the thing that needs doing; 2) respond with some social structure to the question of training which soon arises; 3) build social structural supports and group consciousness through

forming a professional association; 4) engage in political agitation in order to win support of law for the protection of job territory (and its sustaining code of ethics); and 5) articulate rules embodied in a formal code of ethics. We will look at each, briefly, in turn.

Start by doing fulltime the thing that needs doing. Wilensky notes that at this early stage the practitioners come, of necessity, from other occupations. He describes examples of the early stage of recruitment from other occupations into hospital administrators, welfare-agency executives, and urban planners. Earlier we described the example by Blum, et al., of the employee assistance "program coordinators" where, again, recruits come from business backgrounds and social welfare backgrounds and then began to share a common (built-up) "occupationalness." In three out of four of these cases, the "thing that needs doing" was institutionalized through the influence of a social movement: the human rights/welfare movement (welfare agency executives), the "good government" movement (urban planners), and the adult education/quality of work life/mental health/and alcoholism-as-a-disease movements (EAP program coordinators). Often the "thing which needs doing" will not only push for training programs and be implicated in their development, but, in turn, the initial cadre of incumbents of "the thing that needs doing" will be influenced by the internal developments within the training program in a way that acts-back-upon the "thing which needs doing and alter the mission.

For our small sample, our job history data will explore the possibility of two generations or cohorts - the first cohort entering the new environmental regulation jobs in the 1970s and early 1980s were "early stage recruits" and came from other occupations. The second cohort, entering the environmental management roles as they were becoming "occupationalized" during the mid-1980s and early 1990s may show more formal training within the occupation prior to recruitment. The environmental social movement "pushes" to institutionalize the "thing that needs doing" but also, as a continuing movement, helps pressure for and

shapes the additional social structure building up around the regulatory jobs through, for example, the establishment of training programs.

The question of training soon arises. Wilensky offers the example of probation officer training as a new occupation based on the prison reform movement and on a new technique. In the case of the environmental movement we will trace how and at what points it pressed for establishment of formal training. As Disinger and Schoenfeld (1987) note, in 1966 there were "no really adequate schools of environmental science technology" (quoting Caldwell, 1966). Even as late as 1975 the thirty or so programs that had emerged were generally lacking in terms of faculty competence to deal with, for example, interdisciplinary concerns. However by 1987 there were over 220 university-based training programs in environmental studies (Disinger and Schoenfeld, 1987, 186). As Wilensky noted in 1964:

If these training schools do not always begin with the universities . . . they always eventually make contact with universities and there is steady development of standard terms of study, academic degrees, and research programs to expand the base of knowledge. (Wilensky, 1964, 144).

Form a professional association. Wilensky notes that, in the further self-conscious definition of the core tasks, several events seem typical. For example, there may be delegation of "nonprofessional" tasks to other roles (nurses aid?). Also, there may develop differences between the "home guard" who learned the hard way as recruits from other occupations in the new emerging profession, who are committed to the local establishment, and, on the other hand, the newcomers who "took the prescribed course and are more committed to practicing the work wherever it takes them." Finally, hard competition with "neighboring occupations" seems, to Wilensky, to go with the later stages of professionalization. However, with environmental management we want to emphasize the social movement origins and while each of these aspects of a new emerging profession may be documented, they may take on a particular coloration due to the social movement influences which is a particular kind or type of political

agitation, depending, for example, on the type of movement and on the specific context.

There will be persistent political agitation in order to win the support of law for the protection of job territory and its sustaining code of ethics. Wilensky, writing in 1964, observed that state licensure law "usually comes toward the end of the process." This particular emphasis, couched only in terms of "legal protection" of job territory, misses a lot of the social movement institutionalized jobs that have occurred in the 25 years since he wrote. Certainly no stranger to social movement role orientations, Wilensky did a suggestive study of labor intellectual roles (1956) in which he introduced the descriptive concept of "program professional." Yet even in the year he was writing on professionalization in general, (1964). another social movement - the civil rights movement - had been instituting law which then created jobs or "job territory", for example, equal employment opportunity commissions, civil rights commission agents, affirmative action officers, etc. Other "new" social movements had also taken the route of mobilizing for power and passing laws first and instituting jobs second: consumerism, feminism, health and safety, and others. It would seem the social movement "creates" the job territory first - as a goal to be institutionalized in labor market positions - by various social methods often starting, in some historical periods, with legislation. Once the law is passed jobs are mandated by the law. Conditions may exist for further activities (build up of social structure and group consciousness around these jobs) for the self-conscious "occupationalizing" of the role (which is the main focus of our study) which then may lead toward a new, mixed form of "profession."

Wilensky's view in 1964 emphasized that "organizational threats to autonomy and the service ideal" posed the strongest threat to the central norm of professions (service). Certainly this is an important topic often seen as "organizational pathology" (Scott, 1987, Chapter 12; or as a type of power and domination, Foucault, 1986; or as the loss of consciousness,

Abbott, 1989). The early sixties argument was that as an increasing percentage of professionals work in complex organizations, there would be threats to "professional autonomy" since these organizations develop their own controls (professional controls versus organizational controls). Yet we need to remind ourselves that Wilensky developed three categories of role orientation and social controls: professional, organizational, and social movement (or missionary). How do the social movement controls influence the professional and organizational issues?

The argument is that in the 25 ensuing years, in the many social movement institutionalized occupations, it is the "origins effect" (institutionalization) that creates the "work that needs to be done" - it is an action plan form of new emerging professions that has often occurred. It is precisely organization and not proximate individual and group processes around "job territory" that happens first, especially where the social movement pushes for law. The legislation creates new units, expands existing units within organizations and creates entirely new organizations - and along with this come job descriptions (as part of the legislation). While all of this may seem obvious, by focusing only on the "free" professional (doctor, lawyer, architect) Wilensky and others in their efforts to understand the central norms of professions miss some of the story of the (ensuing) organizational context - in the twenty five years of "new social movements" since Wilensky wrote it is the "origins effects" of the social movement instituted organizations that may be shown to be the source in organizational culture of the "technical service ideal." This seeming subtlety that is missing in much of the labor market position in theory can be seen in the case of the civil engineer. Here the role is professionalized (in the early 1900's) in tandem with the complex organizations of urbanism as a social process (Reismann, 1964; Bookchin, 1973). The civil engineer worked in both the new, reform city administrations as well had occupational labor market (OLM) roots in having a "free" professional status, a trained individual. The case is

even clearer for the role of "mixed forms" with many of the 1960s/1970s "new" social movements jobs undergoing various extents of occupationalizing.

Rules will be embodied in a formal code of ethics. We should note in passing that the independent "free" individuals and groups in a job territory action may reach a point where rules are embodied through an association or in other ways as a formal code of ethics. However, in the social movement instituted jobs, not only the "thing that needs doing" but also often the nuances of normative rules and, in many cases, the formal code of ethics are written into law or are explicit in the "origins effect" as a "block off culture" for the strategy-in-action of the "program professional". Their organizational culture sustaining the "mixed form" of role orientation, the action plan (rationalized myth or goal) gives the code of ethics: "clean up the water." There remains a social movement influence, often over time, around norms and codes of ethics that is different than the "labor shelter" discussions of professionals (Freidson, 1986) in much of the literature.

The Labor Shelter Perspective of "Professional"

It is not, as Wilensky says, just that, for example, a complex organization's laboratory (eg., organization) may be run by former members of the lab staff, all of whom pursue administration policies aimed at preserving the workers professional autonomy, or, as another example, that the top staff labor experts in labor unions have received outside job offers which enhance their autonomy "against" the organization. The point is that in many social movement created organizations and occupations it is the social movement which has created and sustains the labor shelter, not primarily or at least initially the individual or "free professional group." Thus if, for Wilensky, the crux of the issue of autonomy for salaried professionals is whether the organization itself is infused with professionalism, the crux of social movement institutionalized jobs that are "professions in process" is whether the social movement, among other

influences, contributed a strong enough "origins effect" and, in fact, is a strong enough continuing movement to sustain and build the "infusion" of professionalism into the jobs created. It seems to me this is a genuine difference between "free" professional labor shelter models (and even the cultural capital model of Boudon) and a social-movement-institutionalized-occupation model as to where the locus of control originates and often ultimately resides: It is less a labor market process than a social movement (and social problem) process. Yet, to follow Weber, in the end there must be a "resolution" of the routinization of movement charisma. It is not that labor market positions don't exist, it is rather that the "power" view of labor market shelters (Friedson, 1986; etc) have gone too far away from other sociological variables (eg. social movements, cohorts) when they look at occupations - a curious lacunae for sociologists.

Perhaps this could be made clearer by making an analogy of the well known study by Stinchcombe (1965) in which he compared the mass production of a mobile home manufacturer (bureaucratic administration) with the organization of the construction trades (craft administration). In mass production, both product and process are planned in advance by persons not on the work crew, while, in craft production, centralized planning of tasks is abandoned in favor of decisions made by the work crew based on their training and occupational culture. There is a clear distinction here between the value occupational culture (craft) in one industry (OLMs) and the advantages of bureaucratic management in the other, which does not rely on training and occupational cultures as much, and may develop small step internal labor markets (ILMs).

If we now view the environmental manager as an autonomous (craft) professional starting with the training and occupational culture, we could arrive at the labor shelter (OLM) interpretation of professionalization. However, most environmental jobs began as organizational slots in an action program established by federal and state laws mandating positions in environmental regulation. So, in this sense, the action plan is like

the mass production model of bureaucratic administration: Clean up the water, make positions to do this, map it all out in a centralized planning system and delegate it out to the states to put aside funds and expand units in organizations for these new roles. It was only after the impact of the "origins effect" of the social movement and the enactment of the major laws (1972) that the training and occupational culture of "environmental management professionals" began (Disinger and Schoenfeld, 1987). The action program, bureaucratic roles then hold the potential to become increasingly autonomous, environmental management occupations - but continue to be heavily influenced by the public planning context.

If we look at this as a difference between internal labor markets (ILMs) and occupational labor markets (OLMs) (see Berg, et. al., 1981), we may see a historical emergence from the ILM within the action program /civil service context to OLM in environmental management (as a craft or profession). This may be characteristic of other PISMO processes work regions. The comparative organization studies and contingency theorists (Woodward, 1963; Lawrence and Lorsch, 1967; Mintzberg, 1983) have noted differences in "integrative roles" based on both environment and type of industry or on different work processes. A social movement institutionalized work process can begin as a highly formalized (bureaucratic) role - a mass production pattern for "cleaning up the environment". Then buildup of social structure and group consciousness, the life histories the first and second cohort, the growth of knowledge, interaction effects in the rise of interorganizational fields, and the continuing influence of the social movement lead to the emergence of less formalized work processes and more occupationalizing of the role. Yet the "origins effect" remains: this is a social movement "jurisdiction."

Our case study examines primarily the senior workers within our small sample. The story reviews the rise of the clean water manager jurisdiction. Wilensky notes that it is difficult to establish a profession, for one reason, because of "threats to jurisdiction". He

observes that knowledge which is either too broad and too vague (social work) or, at other extreme, narrowly restricted and very precise (capable of being programmed into software programs, artificial intelligence or expert system chips) are both types of knowledge making a poor foundation for professional practice. Many new or aspiring professions face the too-broad-too-vague barrier because they are "grounded mainly in human relations skills or some program for reform." As Wilensky notes:

On the other hand if knowledge (to be applied) is narrowly restricted, very precise we are able to break a skill down into component elements, prescribe sequences of tasks in a performance, leaving little to the judgment and understanding of the worker. This equals a job that can be taught to most people often in a short time (or ripe for programming into a computer) (Wilensky, 1964, 148-149).

In "origins effect" action programs, delegated roles, in some cases, started out as potentially capable of professionalization (water quality specialists); others were standard bureaucratic "hats" (program managers), specialists, regulators, and analysts. Whether they entered the new environmental positions as planners or program managers the first cadre of incumbents entered from primarily other occupations. and, as the first cohort, "came up the hard way" - learning the role "on the job." Our study may show that some of the original jobs requiring six months "to get up to speed" may have become more or less precise, more or less broad due to program policy changes over time, but that the overall effect has tended toward the possibility for occupationalizing around an "exclusive jurisdiction:" Clean water manager. Part of this exclusive jurisdiction is growth of knowledge, part of it is on-the-job knowledge and additional training, which, especially for the seasoned first cohort, has become important "tacit knowledge."

Wilensky describes the underreported importance of tacit knowledge in constituting what makes up a professional job (or "occupationalness" of a job):

The expert may be defined as a person who knows so much that he can communicate only a small part of it . . . diagnostic knowledge that they do not learn from books. This element of tacit knowledge in the sciences and professions helps explain

their achievement of exclusive jurisdiction; it also helps explain their traditionalism. The client public sees a mystery in the tasks to be performed, a mystery which it is not given to the ordinary (person) to acquire . . . The tacit component of their knowledge based is a seldom recognized cause of the tenacious conservatism of the established professions (Wilensky, 1964, 149).

It can be agreed that the role of tacit knowledge in professions is crucial and yet what "traditionalism" is there to an entirely new occupational tacit knowledge? It may be there, but as an emerging traditionalism. One can grant that, after the tacit knowledge has built up (and the buildup of social structure in long training and group consciousness has occurred), that there then develops a traditionalism around that tacit knowledge. Yet, with the "origins effect" of that tacit knowledge in a social movement, and continuing to be influenced by the place of that knowledge in the social movement, a cohort, having built up tacit knowledge, really is in the position of being a "program professional", following the environmental movement program. But, to say this is to admit into the "tenacious conservatism" of the established professions a new, mixed form of conservatism which builds up and preserves specific tacit knowledge around social movement goals. Wilensky makes the start on this research agenda by observing the role of labor staff experts who want to "keep labor left." Our point is that there are many more such "program professionals" amidst the new social movements of the last twenty five years and that the examination of these new, mixed forms is understudied.

What extent and types of tacit knowledge are held by senior worker, environmental managers? It would seem to be like the top staff experts in unions Wilensky describes. If so, it would seem important to the environmental movement to protect "seniority" among senior environmental workers, just as seniority in labor relations protects the tacit knowledge in union matters and labor relations of union members of long years. In the environmental movement a similar logic may explain the "push" for more senior level positions (currently 29% of DNR). Exclusive jurisdiction may also be partly a cohort phenomenon which we will briefly explore.

In general, the occupational sociology strategy, which started out using the "free", established professions, as a base for their definition of professional, has now moved toward the new, mixed types of professionalism. Wilensky does this well, but, by locating the key norm in the technical service ideal and the origins of the key norm primarily in starting to "do fulltime the thing which needs to be done", he underrepresents the possibility of social movement and organizational origins over the ensuing twenty-five years for the specific norm(s) of technical service. Norms originating in this way (after, eg. enactment into law) can be taken up by individuals and groups and have the potential, through social change processes, to become not only a social movement role and organizational position, but a professional occupation.

Ritzer and Walzcak (1986) have provided a general model of this process of professionalization in which specific "steps" are involved. Their middle-range (power and conflict theory) process approach, following Wilensky (1964), includes the following characteristics: 1) full time occupation, 2) change of name, which becomes the occupation's exclusive domain, 3) national association, 4) training school, 5) code of ethics, 6) political agitation to win popular and legal support (Ritzer and Walczak, 1986, 66). Clearly water quality managers have progressed over the last twenty-five years through some kind of occupational process mirroring these steps of the "professionalization process."

The specific history of the sample after 1965, which is the major focus of this study, is an example of a "profession in process" in the Bucher/Strauss sense - except that, instead of focusing entirely on dynamics internal to the "profession in process" (and the growth of core activities in specialty areas), we wish to emphasize the additional factors of cohort, add the "origins effect" on an organizational level (beyond individual and group), include the external influence of the larger environmental social movement and its influence on segment, cohort, origins effect and growth of knowledge, and add the interactions of the

associated developing ancillary and counter roles of the emerging interorganizational field.

The PISMO processes model place the social movement as the independent variable leading to subsequent occupational structure and role development. It is true that, as Bucher & Strauss (1961) have it, divergent core activities develop within a profession. For medical pathology, they give an example of how urinology and proctology emerged as separate specialties out of general medical surgery. These same observations could be made about the subspecialties of water quality itself, and for water quality management in general as it moved from the regulation and engineering of the pre-environmental movement period into the newer specialties and general occupational culture of environmental management. But clearly the water quality management story cannot be summed up entirely in terms of an internal focus on the proliferation of specialties (the focus of the Bucher & Strauss paper). We encounter again the tendency in the emergence of occupation literature to not focus on contextual or historical phenomena (See Salaman, 1981) but rather to have an individual and group level "labor market" perspective.

In their description Bucher and Strauss note that a "profession" can have great internal divergences around "sense of mission", "work activities," "methodology and techniques," "clients," "colleagueship," "interests and associations," and "spurious unity and public relations." (Bucher and Strauss, 1961, 326-332). However, as valuable as their work is, for our sample we need to also emphasize phenomena external to careers and segments (p. 334).

Social Problems Theory - Effects on Occupationalizing

Social Problem Process Theory

The social constructionist perspective in social problems theory takes the "defining of the situation" as central to the social problems process. This research strategy emphasizes social processes of "containing trouble and avoiding problems," the "creation, ownership, and processing

of problems," and tends to focus on public regulatory bureaucracies and legal institutions. Other themes emphasized by this approach include "medicalizing problems and troubles," and the role of social problems and the news media (Kitsuse & Spector, 1973; Schneider, 1985; Hilgarten and Bosk, 1988). The argument of Kitsuse & Spector (1973; 1977) and Tallman & McGee (1971) is that a distinct theory of social problems is possible by sticking to the theoretically informed research problems the above questions ask about the definitional process. Within this literature there is an emphasis on both "natural history" and on social movements.

Schneider points out that in order to generalize, it helps to examine case studies from similar settings. For example, one might study problems involving public regulatory bureaucracies. He asks:

What generalizations might be made about how the news media figure in social problems? What cast of characters emerge at various points in this process? One pitfall to avoid here is the ad hoc, overly topical quality of so much past social problems writing. By using comparative, analytic categories defined by their effects on viability, or examining how the definitional process is moved along by the activities in question (Kitsuse, 1984) this might be avoided.

Also, the sequential aspect may involve overlapping, simultaneous, continuously ricocheting interaction (Weiner 1981) that traditional "natural history" approaches might not emphasize by overstating the extent to which kinds of activities occur only at certain points (Schneider, 1985).

There is a debate in the literature as to whether these processes should be described from a social movement point of view or from a "social problem process" perspective. However, for the purposes of our study, we do not need to resolve this argument but can utilize theoretical grounding from both perspectives.

One of the things that "sociology of trouble" might indicate is that the "social problem process" often creates steady work. Environmental management, for example, tends to be steady work. Jobs in WWT processing are not subject to economic downturns, as is manufacturing. Some roles in the wastewater pollution control industry have become more and more implicated with the growth of knowledge (especially the "sanitary engineer"). This links not only to the organization and occupational capacity to utilize "social problem processes" but also to the general

role of knowledge in modern social structure and the rise of "new classes" based on knowledge.

New Class Theory

It was Weber who saw the ultimate bases of power in rational-legal bureaucracy as premised on knowledge (Wright, 1975). Many have followed this lead with stratification theories of "new class." Social movement processes in both earlier eras and in recent times contribute to innovation of many new occupations. The "new class" theory would locate our "middle range" theories of social movement, social problems process, general societal processes of occupationalizing, and "professions in process" as part of a larger structural (dialectical) transition where knowledge replaces money as the key bases of the political economy (Gouldner, 1979). The "waves" of new class theory (Szelenyi, 1989) reflect different premises, but are agreed on the rise of a new social force based on knowledge. The issue of "new class" raises difficult questions that this study is not designed to answer. Some of the occupational issues our case study raises suggests that the environmental movement and environmental management may play a role in the stratification dynamics of any coming social order, and in particular, the relation of emerging occupations and stratification dynamics merits further study.

While we cannot examine the rather large question of the bases for stratification and social class dynamics in the social order with this case study, we can, through documentary research and interviews, help construct a natural history designed to focus on conditions, processes and outcomes that affect occupationalizing. Social movements contribute interactions with other elements in the social order which create some of these phenomena that may influence emerging occupational forms. What are the processes? How do new occupations emerge? How do social movement institutionalized occupations differ in their emergence from other occupations?

SECTION FOUR: HOW SOCIAL MOVEMENTS AFFECT OCCUPATIONALIZING

Many emerging occupations have an aspect that is not purely "labor market" but also made up of conditions related to the "origins effect" and continuing demands of their social movement constituencies. There are several different "regions" of social movement institutionalized occupations in the division of labor including both reactions to the excesses of industrial society and the problem of nonaccess. Meyer Zald has noted that the growth of a cluster of movements "that are reactive to the negative externalities of economic growth and the industrial production system" are all aspects of a " . . . set of reactions to the spin-offs of the complexities and conflicts over technical decisions (Nelkin, 1984)" (Zald, 1988, 25). In other public planning fields, the movements are reactions to problems of nonaccess, such as the cases of parts of civil rights, certain dimensions of feminism, urban advocacy, and consumerism. Still other movements may be linked to changes in political complexion, such as urban planning or humanitarian welfare reform. Yet in all these cases, as these movements institutionalize, they have the problem of making jobs and occupations stable. The issue does go to the classic question of Weber: How can the social movement resolve the "routinization" problem, especially the structures embodying staffing patterns. Both level of confidence in routinization and the visible rise of social structure around staffing are part of the consciousness of emerging occupational groups.

In the state civil service departments of natural resources, community assistance planning has been influenced by the "older" social movements (pre-1968, see Wallerstein, 1988) connected with public works, urban reform, and public planning in a way that led to an "engineering" (perhaps to a certain extent a "growth coalition") type of occupational culture. However, the "newer" (post-1968) social movement ecological sensibilities have tended to emphasize a decentralist, more science-based,

and lifestyle issue value-complex which could be described as more of an "environmental" occupational culture. Simonsen (1990) has worked on describing some of the features of "new" social movements. However, each social movement ("new" or "old"), and any institutionalized occupation associated with it, will have its own specific historical character. In section two we reviewed how social movements affect job creation, in general. Now we want to ask specifically how social movements affect the build up of social structure and group consciousness - how social movements make jobs into occupations. Part of this question has to do with what other persons are interacted with and how many reminders there are of that status of being in a social movement job-becoming-an-occupation.

The Social Movement and Role Incumbents in the Process of Occupationalizing

The issue of the build-up (and social supports for) social structure around work activity raises the issue when the role-occupant in that job has become conscious of being in an occupation. The problems of occupational coalescence have been sketched by Abbott (1989) and a model of measuring occupational emergence has been provided by Blum, et al., (1988). We need to remind ourselves that when major social movements first start many of the practitioners of the first roles "routinized" are amateurs, or may have come from backgrounds different than the new role. The new job itself may not be fully stabilized. Yet, in the context of mass movements, many jobs that have built up social structure around them and are characterized by a conscious social group have variable realities in the numbers, funding, or scope of their role. This is exemplified in "downsizing" occupations like contemporary union officials as well as "upsizing" occupations like, in general, the environmental positions. Other brief examples would be the changing fortunes of affirmative action officers, and many other movement innovated public sector (and private sector) jobs.

To summarize, it may help to phenomenologically bracket "stabilized role expectations" (of emerged occupations) to capture historically relevant nuances of such variability in role coalescence: What is the variable scope of built-up social structure and group consciousness of an occupational collectivity? Under what conditions does level of social structure and group consciousness change? Finally, we hope we have made the point that there are many occupations where macrosociological, middle range processes, and microprocesses all need to be examined as dynamic processes in an historical context. The kind of knowledge that case studies of social movement institutionalized occupations might contribute to the understanding of work and society is not far removed from the central questions of sociology. One of those central questions involves the role of social movements. However, social movements have not been frequently analyzed as a labor market. Yet "professions" have often been seen in terms of labor market dynamics.

Seen as a "labor shelter" phenomenon (Friedson, 1986) guided by professional norms, then, the older professions (doctor, lawyer) in this early 1960s model provided a definition of professional based on "professional" control. This tradition has been recently followed up on a more theoretically developed level by Abbott, (1989). In the early 1960s model, when professionals were in organizations, a second type of control could come into conflict with professional norms: organizational controls. In more recent views the professional's bases of power in knowledge as a form of "capital" is stressed.

Contemporary theorists are more influenced by conflict theory and the "post-industrial" premises emphasizing both power and knowledge. These approaches view knowledge occupations as establishing themselves in the labor market with a base in cultural capital (Bourdieu, 1988) or the professional "currency" of knowledge (Abbott, 1988). Yet suppliers of knowledge need their market structures of demand. Considering just the question of "utilization of research" we should note the rise of and

importance of social movement institutionalized policy systems in recent decades. This influence of social movements and social problem processes on the formation of new policy systems, and in influencing existing policy systems to change some of their emphases, is an important part of the story of emerging occupations. Such movement influences also encourage already established policy people to utilize research.

In other words, it isn't always a case of trying to get social research "utilized by policy people" based on such research's imminent contribution to the "growth of knowledge" (see discussion in Lakatos & Musgrave, 1970). The circuitous routes of the growth of knowledge includes social movements getting policy systems established (new centers, new cabinets, new institutes, etc.), and continuing to influence both the instituted and the existing policy systems. In effect, the "cultural capital" view needs a "formation of capital" theory (see Keynes, 1936). These leads would tie in with the formation of markets (eg., labor markets) and not only with the jockeying of specific cultural capital within existing professional system (or labor) markets. Abbott (1989) begins to lead us in this direction with his general discussion of the "staffing" problem of contemporary society.

In summary, social movement instituted occupations, organizations, and interorganizational fields form markets, influence existing markets to alter and change, and serve (supply) existing markets in various ways. By stimulating new knowledge, social movements contribute to the formation of cultural capital (new knowledge and new practices). Social movements push for new doctrines or knowledge to be applied. This stimulation and development of knowledge leads (through processes to be examined) to an occupationalizing pressure for "orderly careers." The dynamic toward "occupationalness" also includes the classic question of the "routinization of charisma" that has been addressed but is understudied. (See, for example, the discussion of Rothschild, 1976).

Weber (1946,1947) observed that occupations emerged through the institutionalization of social movements as movement leaders seek regularized staff positions for themselves due to economic and status conditions. He also saw that a "charismatic movement" itself would encounter this routinization dilemma separate from the question of elites or leaders.

Occupational theorists have followed Weber's insight in reflections on how occupations can emerge through social movements (Hughes, 1958; Wilensky, 1964). Recently cultural theorists such as Swidler (1986) have developed implicit models of the routinization of charisma. She has viewed culture as playing qualitatively different roles in placid times and in turbulent times. In the turbulent times (characterized by many social movements) "blocks of culture" are utilized (or appropriated and adapted) to "provide cultural components that are used to construct strategies of action." Occupation can be seen as a strategy of action of social movements and their organizations as well as individuals or groups within established labor movement or "professionalization" dynamics.

While legislation and work roles seem to have followed Scott's "model" of general rationalizing processes, influenced mostly by professional reform, with the emerging occupations as a "strategy of action" at the cultural level (Swidler, 1986), there is also a "connection" between new occupations as "institutionalized elements" and as organization "operators" and social liberation movement. The cultural and social liberation dimension of the ecology movement, for example, is so considerable that "environmental management" cannot be considered solely as a reform movement. As a consequence the analysis of legislation alone will not highlight the accompanying build up of social structure and degree of self-consciousness of environmental managers.

If a social movement is not to remain a purely transitory phenomenon it must take on the character of "a permanent relationship forming a stable community . . . or organization" (Weber, 1947, 364). The charisma

of a social movement is an important dimension for reforming, revolutionizing, or liberation movements (Hannigan, 1985). But the charismatic form of coordination "may be said to exist only in the process of originating." It cannot remain stable but becomes, for Weber, either traditionalized or rationalized, or some combination of both. The ideal and material interests of the followers and leaders (staff, organizers, principals) is to put "their own status . . . on a stable, everyday basis" so that it is possible to "enjoy a secure social position in place of the kind of discipleship which is cut off from ordinary, worldly connections, notably the family and in economic relationships" (Weber, 1947, 364). (See also Haber & Haber, 1967, in Colfax and Roach, 1971, 391).

Weber's discussion provides insight on how the institutionalization of a movement becomes a source of formal structure. Yet he tends to emphasize authority issues more than organizational or occupational themes. Scott makes a more recent observation that:

In recent years, analysts of movements have placed more emphasis on their organizational features - for example, the extent to which they are guided by a full-time, paid staff and have regularized mechanisms for obtaining resources and recruits and for setting goals (see Zald and Ash, 1966; McCarthy and Zald, 1973). It would appear that this shift in emphasis reflects both changes in the perspectives employed by social analysts, who are increasingly sensitive to organizational features, and changes in the nature of social movements, which are more likely to adopt organizational models [Scott, 1987, 22].

A full-time, paid staff of a social movement can create jobs and build-up social structure and group consciousness around movement-internal, "regularized mechanisms" (resources, recruits, and goal setting). This can happen in all four of the types of social movements discussed earlier. A social liberation movement may develop, for example, banking occupations in an interorganizational field of cooperatives as in the Mondragon system in Spain (Rothschild & Russell, 1986); a revolutionary movement may develop paid organizer positions (Claudin, 1976); in social reform movements, many movement-internal positions may develop which is why, in a time characterized by reform movements, analysts may turn more toward

organizational models of movements (Zald, 1988); and cultural movements may develop at least certain "full-time part-time" positions often in voluntary organizations typically around communication, funding and limited time-frame "events."

However, while the stories of the emergence of occupations from social movements that institutionalize in the larger occupational structure of the regional, network or national labor force is linked to the emergence of occupations within the various types of social movements, the conditions under which they become separate topics seem important. As social movements (partially) institutionalize into jobs and occupations "outside" the movement, such movement-external work activity becomes part of some "larger" social unit. Boundary definitions and boundary-maintenance processes will be analyzed later. However, understanding the process through which movements become part of a more complex political/ecological/economic social organization requires an analysis of social movement instituted jobs and occupations that keeps social movement "origins effect" phenomena in focus.

Some social movements fade away and leave jobs and occupations as a "residue," with a variable remaining "origins effect" which could be assessed through historical analysis. Other social movements continue. In the latter case, especially the ongoing relationships between movement-internal and movement-external "social movement instituted occupations", is important.

To observe, however, that social movements are becoming more like organizations is a complicated topic deserving treatment on its own. Suffice it to say here that one way to keep the "origins effect" implications of social movement instituted jobs is to explore the original and subsequent waves of "recruits" into the social movement as cohorts which subsequently may contribute generational or distinct cohort effects to the occupationalizing of those jobs. What is the role of cohorts in analyzing the question of how social movements affect occupationalizing?

Social movements, of course, take time, ideas, and organizations to form. As Eyerman notes:

They build over time and around ideas, producing new collective identities, leaders, and organizations, yet cannot be reduced to any one or even several of these aspects. Social movements do not emerge fully formed and the synthesis around which social movement theory should be directed must begin with the recognition that movements take shape in distinct historical situations and are thus fundamentally affected by the political cultures, broadly understood to include actions as well as attitudes, of the societies in which they arise (Eyerman, 1989; Eyerman and Jamison, 1991).

Part of the particular shape social movements take may include the influence of distinct cohorts, and national history, and, of course these are empirical questions. For example, our study may indicate that the USA environmental movement involves a particular cohort or generation (Mannheim, 1935; Lemert, 1988) with unique characteristics. Our case study raises the issue of a cohort thesis. (See Kertzer, 1983; Mannheim, 1935; Lemert, 1988; Wallerstein, 1989; Hareven & Adams, 1982). Intensive interviews with key informants, presented in Chapter Three, will report on initial incumbents that may represent a cohort experiencing historical "critical events" that link identity to social experiences.

The advent of environmental managers' jobs altered the occupational structure through the creation of many new ancillary and counter roles in the wastewater industry "sector." We have analyzed this occurrence as a social movement instituted shift in the occupational structure. There were specific historical conditions at the time of founding of the recent environmental organizations which influenced the initial job descriptions. How has the fact that this shift in the occupational structure involved the emergence of a large "societal sector" with interacting roles influenced the "occupationalizing" of the environmental manager role? How have the new clean water manager roles emerged? Part of this story is found in the way in which these jobs were created to interact with other roles in the interorganizational field. Part of the story lies in the altering of pre-existing positions. Part of the story lies in the characteristics of the initial incumbents, the continuing social movement,

complexity, rapid change, and growth of knowledge effects. Has a new occupation emerged? Have program professionals developed in this new occupation? To these questions and this history we now turn.

THESIS

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THE EMERGENCE OF AN OCCUPATION: CLEAN WATER MANAGERS
A CASE STUDY OF THE MICHIGAN DEPARTMENT OF NATURAL
RESOURCES (MDNR) MUNICIPAL FACILITIES GRANTS
SECTION 1965-1991 AND A 1992 SURVEY OF THE
MDNR SURFACE WATER QUALITY DIVISION

By

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CHAPTER 3

STEPS AND SEQUENCES IN AN EMERGING OCCUPATION

Results of a Case Study of the Michigan Department
of Natural Resources (MDNR) Wastewater Treatment Grants
Administration Program Work Roles for the period 1965-1991
and a 1992 Survey of the MDNR Surface Water Division

"Water . . . without it
we are nothing"

Leonardo DaVinci

PART I: INTRODUCTION

Clean water manager roles emerged on a large scale as a type of work only in the mid-1970s after a decade of social movements and amidst a changing environment of increasing public pressures for programs, organizational changes in governmental roles and agencies, and an emerging professionalization of roles and growth of knowledge. This changing environment for water quality management brought forth (at least) five specific phenomena that have contributed to the making of the clean water manager's role. This chapter and Chapter Four describe these emerging phenomena as they have played out in the Michigan Department of Natural Resources (MDNR) wastewater treatment (WWT) Grants Administration (Municipal Facilities) unit and the MDNR Surface Water Division.

What was emerging in the "making of the clean water managers?" First, in the field of wastewater treatment there was the emergence of what conflict sociologists term occupationalizing "segments" (or conflict and change strata). The nature of the conflict and change centered generally around "ecological vs. engineering" perspectives and, of course, the challenge of many emerging environmental subspecialties competing with

(and modifying) the older engineering model. Second, two distinct post-1950s cohorts developed: the initial "environmentalist" cadre, who are now senior workers, entered new roles in the late 1970s and were influenced as a generation by the social movement and "origins effect" period of 1968-1973; and a second cohort trained in the new university environmentalist training programs - a cohort which emerged in more recent years (1980s and early 1990s). After the new programs were instituted in academe, the second cohort began filling the entry level positions, and, as they entered the established roles, received on-the-job training by the first cohort. A third, continuing influence was the larger environmental social movement (external to water quality as distinct from social-movement-like internal segments) which has had phases or periods of change affecting water quality roles. Fourth was the growth of knowledge, seen partly as the "increasingly specific behavior" of characteristic work activity in water quality (Bucher and Strauss, 1961), and as professional "currency" enhancing the incumbent's occupational position in the labor market (Abbott, 1988). Also, the above changes may be seen as crises in Kuhn's (1962) sense of competing paradigms. The first cohort initiated a more "environmentalist" world view versus an older "engineering" world view. There is also a more recently emerging paradigm crisis in which evidence is leading toward the linkage of conditions of such specific media as landfill, air, urban runoff, toxic wastes, and groundwater to surface water problems, potentially offering further influence on occupationalizing processes in surface water roles. A fifth influence was an "origins effect" produced by the environmental movement through the environmental lobby and Environmental Protection Agency (EPA), and by the DNR water quality organizational culture. Part of this origins effect lies in the "new federal model" of the 1960s and 1970s, and the combination of social movement, organizational, and professional components (Wilensky, 1964) emerging within this larger general societal process (Scott & Meyer, 1983) or rational myth "script" (Meyer & Rowan, 1977).

Chapter Three presents the results of our case-study analysis and a report of a survey designed to bring additional data to bear on these matters. We begin by presenting a straightforward history of the events leading to the expanded water quality roles. A description of the subsequent changes in the job descriptions and organizational context of one water quality section, the wastewater grants unit program within the State of Michigan civil service, is presented. Specific results of the case study and the survey of the MDNR Surface Water Division are reported in a three-step model in Section Four of this Chapter describing data for eleven central research questions.

The results presented in this chapter are interpreted later in Chapter Four in terms of conclusions we may be able to make about the existing theoretical work on the emergence of an occupation. The research design reported in Chapter Three focuses on the history of the role, and on who filled the role. Conclusions about the extent of occupationalizing of the role are reported in Chapter Four.

We begin our history by describing the organizational dynamics of the federal grants program in the wastewater field. In the 1960's the rivers were polluted; the lakes were dying. The story begins with the social movement instituted innovation of an expanded permit system backed up by federal funds (National Environmental Protection Act, or NEPA). It was 1969. The nation had decided to clean up its water.

Before beginning this history we will sketch the conceptual framework to be used. To study this as an emergent occupation we needed a model. As diagrammed in Figure 1 (p. 22), the emergence of the clean water manager role has been conceptualized as an example of the partial institutionalization of a social movement into a mixed form of "new profession" (Wilensky, 1964). This mixed form of profession is different from the free standing, traditional profession. The social movement form of "program professional" role arises from attributes of incumbents and attributes of the position and involves a mixture of professional goals,

organizational goals, and movement goals. Among conditions giving rise to a program professional role is a build up of social structure around this role and emergence of group consciousness. The "program professional," then, is an example of a type of work that has become an occupation.

The central research problem is to explore how a type of work becomes an occupation. Such a process is conceptualized, as mentioned, as an increase in group consciousness and the build up of support structures (Abbott, 1988, 281). The question of the emergence of occupations itself is understudied, and while it has been noted that social movements often are linked to the emergence of occupations, this phenomenon also has not received sufficient study (Abbott, 1988, 149). How does a new social movement role or a new social movement instituted type of work become an occupation?

Steps Toward Occupationalness: Central Research Questions

"Occupationalness" resembles class consciousness; it results from social and cultural structuring of merely implicit links (Abbott, 1988, 276). We introduced this concept in Chapter 2. The new clean water manager roles, it is hypothesized, develop a particular type of "occupationalness" which, following Wilensky, we label a program professional role. The emergence of this type of occupationalness is conceptualized as occurring through a three-step sequence of events: 1) the rise of the environmental movement and subsequent partial institutionalization of its goals into legislation, positions, and organizations; 2) the initial definitions of the role and characteristics of its initial incumbents, as an "origins effect;" and 3) a process of occupationalizing in which various pressures for greater autonomy, careers, training and support structures, and the development of shared occupational identity emerges. This approach leads to some specific questions that need to be answered for us to be able to understand and generalize the process.

In this attempt to understand and generalize we present eleven central research questions developed around the identified three-step

sequence. The three steps include: (1) specific features involved in establishing the position, (2) elements of a concurrent and persisting origins effect, and (3) a process of occupationalizing the position. The central research questions follow.

Research Questions

I. Establishing the position

- 1) How did the environmental movement influence the emergence of the position? (movement effect, institutionalization effect)
- 2) How did the environmental movement influence characteristics of initial incumbents? (movement effect, cohort effect, origins effect)
- 3) Did the emergence of the position and characteristics of the initial incumbents affect the environmental movement? (interactive effect)

II. Origins Effects

- 4) How did the initial definition of the position affect subsequent developments of it? (origins effect)
- 5) How did the characteristics of the initial role incumbents affect subsequent development of the role? (cohort effects)
- 6) Were there continuing influences of the environmental movement on subsequent development of the position? (continuing movement effect)

III. Occupationalizing the Position

- 7) What structural supports for the position have developed? [Training programs, career lines, professional publications] (occupational emergence)
- 8) Has a consciousness of occupational identity emerged? (occupational emergence)
- 9) If there is a "second cohort" how does it relate to the occupationalizing process? (cohort effects)
- 10) How did the environmental movement affect increasing complexity of the position? [Growth of knowledge, increasing regulatory rules and procedures, development of organizational fields, changing water quality problems, etc.] (movement effect)
- 11) To what extent has the position developed the characteristics of Wilensky's (1964) "new mixed professional" or "program professional?" (program professional effect)

The Plan of the Chapter

In this chapter we review the method of the case-study, indicating the manner in which each specific technique was used (participant observation, structured and unstructured interview, secondary sources, survey questionnaire). We also indicate the potential generalizability of the findings to other water quality settings and to other instances of occupationalizing. A general history of water quality programs (federal, state and local) is provided. We then present a review of the three-step sequence and present data for each of the eleven research questions, indicating, in a summary, the specific findings.

PART II. METHODS

This study utilizes primarily qualitative methods. Jackson Toby has made the following comment about the usefulness of qualitative methods:

. . . two distinguished social researchers (Barton and Lazarsfeld, 1955 reprinted in Lipset and Smelser, 1961) examined 100 studies in which investigators analyzed qualitative rather than quantitative data. They sought to contribute, on the basis of current research practice, a tentative answer to the following question: "What can a researcher do when confronted by a body of qualitative data - detailed, concrete, nonmetric descriptions of people and events, drawn from direct observation, interview, case studies, historical writings, the writings of participants?" They found that qualitative data can, in the early stages of an investigation of a problem, contribute to the formulation of the problem, to classification of variables, and to hypotheses relating one variable to another (Toby, 1964, 56).

In this study we utilize a "natural history" framework, appropriate for both qualitative and quantitative data, to focus on (a) how the external social context (origins in a sustaining social movement, an emerging organizational field, growth of knowledge, etc.) conditions the development and influences the processes that contribute to the emergence of the position, and to the change and growth of this position as an occupation (build up of support structures, group consciousness, etc.) and, (b) how the internal job-specific organizational context and interorganizational network relations in this type of work may help explain how the extent of "occupationalness" of the position may develop

(and respond to) structural conditions. In this sense the approach is in the "institutional tradition" as a case-study. (For a review of the institutional approach, see Perrow, 1986, Chpt. 7).

A natural history is a study of the changes that a phenomenon undergoes. We are studying the phenomenon of a new labor market position, the extent to which that position becomes an occupation, and how "occupationalness" emerges. A natural history implies an unfolding course of events, phases, landmarks, and characteristics. As Rue Bucher notes:

The idea of a natural history . . . should be understood as an analytical tool, not a description

(1) Delineated phases are not fixed and immutable; they serve as organizing foci in our comprehension of the phenomenon.

(2) The boundaries between phases are permeable.

(3) There is no necessary progression from phase to phase, nor is there any set endpoint.

Given these reservations, what is to be said for a natural history framework? The answer, I believe, is that it is a profoundly processural approach grounded in structure. Processes are in the foreground, but they are affected by background structural conditions. The processes discussed here concern how members of an occupation define themselves and their condition, and the coping strategies they devise. Structure refers to the "givens" of a situation, but structure is not fixed or immutable. Occupations may strive to alter the structure of their circumstances, but insofar as they succeed, they enter a new phase, with its attendant new set of structural circumstances (Bucher, 1988, 132-133).

Level of Analysis

The level of analysis chosen (person, group, organization, organizational field, societal) is defined in terms of the dependent variable (Perrow, 1986, 194; Robbins, 1990, 28; Ritzer, 1988, 397; Salaman, 1981). Some occupational sociology tends to emphasize the individual level, primarily focusing on the experience of individuals in work roles (Hughes, 1958; See Holstrom, 1984 for a review of Hughes' work). We want to, however, also explore effects at other levels, including social movement effects, cohort effects, growth of knowledge effects, historical context, and the implications of a growth in social

structural supports and group consciousness. A focus on the structural and processural dimensions in the sociology of work is needed to understand "occupationalness." To do this we need to move above the narrowly micro and beyond the overly broad "general societal" occupationalizing processes to examine the additional effects mentioned, and the contextual opportunities and constraints that structural levels (group, organizational, interorganizational, societal) create.

One of these newer societal phenomena has been the growth of societal sectors. In fact, the growth of a functional, vertical, extra-local "societal sector" (Scott & Meyer, 1983) in the occupational and organizational activities of wastewater treatment is a crucial structural level variable for our case. As we attempt to move, then, between the micro and macro levels in the analysis of occupationalness, we hope to build an interpretation which uses a "value-added" process view (Smelser, 1959, 1963)¹ on how a new "program professional" organizational field emerges. To do this a variety of techniques were utilized in the case study.

Specific Techniques Used in the Study

Initial interest in the wastewater management role developed from an organizational development project (ODP) conducted in the winter of 1987. That ODP activity included one-hour interviews with all twenty-two members of the east unit of the (wastewater treatment) Grants Administration section. Several group meetings were also held and a composite of the interview survey data was presented in an organizational development "feedback" session which involved the formation of temporary task groups. One of the major themes emerging from that action research was the concern of unit members about the lack of professional development around the positions. Other concerns included a "bottom up" performance appraisal, issues of autonomy in the role, and larger departmental issues of participation. Subsequently a followup research project was begun as a larger case-study which is reported here.

Our case-study utilized intensive interviews of seven key informants between the spring of 1987 and the fall of 1992 as the primary research method. Documentary research was also used to gather the historical data on the role incumbents, their social context and the developmental processes for the emergence of their job, its set of organizations, and extent of occupationalness. In addition a seven-page mailed questionnaire surveyed forty-nine respondents in the MDNR Surface Water Division during the winter of 1992. The data are presented in later sections of this chapter and some conclusions are given in Chapter Four. The methods used, then, included (1) documentary research of primary data (job memoranda, directives, delegations, letters, laws, reports), (2) secondary data (literature such as trade magazines, professional journals, histories), (3) interviews with occupants of this job category (ODP action research, key informant interviews, structured interviews), and (4) a mailed questionnaire. National EPA memoranda (as an example of primary data) established the delegation of program responsibilities to the positions studied. Trade publications and professional journals provided reports on aspects and conditions of role development. Interviews corroborate how participants viewed the developments in this job (See Appendix A for results of the 1992 mailed survey). The mailed survey questionnaire was used to gather supplementary information on role incumbent attributes (work history, biography, training, and demographic data) and to establish current (1992) attitudes and relationships to organizational, professional, and social movement dimensions of their role (with measures of needs, opinions, judgments and perspective). (See Appendix A for the mailed survey questionnaire).

Results of interviews, used as data for analysis, and for interpretative insight in developing hypotheses,² can provide a useful social research tool (See Blauner, 1987, on the interpretation of interviews). Periodic unstructured, life history, work history and detailed job description interviews of several key informants over five

years (1987-1991) were followed by a structured interview of seven incumbents in three sections of the MDNR Surface Water Division in the late summer of 1991. The interview schedule was developed from the theoretical considerations discussed in our first two chapters. These interviews specifically focused on the processes (Scott, 1983; Ritzer, 1986) and conditions (Hughes, 1958; Ross, 1976; Abbott, 1989) of the emerging occupationalness of the position (Blum and Tootle, 1988). The mailed survey questionnaire was then developed on the basis of the theoretical considerations in our first two chapters and refined on the basis of using the structured interviews as a "pre-test" questionnaire. It was sent to 69 MDNR Surface Water Division workers, and achieved a 72% return rate with a total N of 49.

The setting. The national program (the rise of national and regional water management institutions such as EPA and EPA regions, and the national laws) is relevant to the occupational history we present. However, while there are wastewater treatment plant and drain (WWT) "sectors" in each of the 50 states, our population for the case study will consist of one such local state sector: the Michigan grants administration program unit (and its organization set) for wastewater treatment, and more generally (in the mailed questionnaire), the five sections of the Michigan Department of Natural Resources Surface Water Division (Great Lakes and Environmental Assessment, Permit Section, Compliance and Enforcement, Planning and Special Programs, and the Municipal Facilities Section). The mailed questionnaire was sent to all five sections of the Michigan Surface Water Division to check similarities and differences with the primary case-study focus setting: the municipal facilities (wastewater treatment) section. During the federal WWT grants program (1973-1991) this societal sector was served by the Michigan civil service reviewing agency in the Division of Surface Water - the Grants Administration unit.

The expanded federal grants program which operated from 1972 to 1991 was responsible for a major clean up of the nation's waters. The program

is currently being phased out as a grants program and being changed over to a loan program. Clearly, in a more lengthy study of the WWTP grants program, local, state, and regional conditions for this program and its occupational roles would differ. Such a larger study (larger sample of different states) could be done. We feel, however, that given the scope of our resources, studying one state can bring out many of the relevant questions, and may be generalized, since many of the program features were established as uniform by the national EPA delegations and memoranda for all the states, and many of the occupationalizing processes may be similar.

It is in this second sense, the generalizability of our case study to other similar emerging occupations - occupations either similar in setting or similar in "occupationalizing" processes - that this study may have wider relevance. In other instances of occupationalizing some of the same social movement influence, cohort effects, and growth of knowledge may be present; some of the same methods of study may be applicable; some of the same processes may be germane; some of the emerging organizational field dynamics may be present. In relationship to its impact on social life it would seem, in particular, that studies of the "program professional" role in general are lacking in the literature. To make a contribution to understanding the sequence of events of an emerging occupation requires that the account of the occupation and organizational field be both historical and cultural, as well as structural (Scott, 1983). To this history we now turn.

PART III: A GENERAL HISTORY

There was a history of federal involvement in wastewater treatment (1956-1965) prior to the late 1960's movements. The Federal Government first got into the field of funding wastewater treatment plants to reduce water pollution in 1956 with Public Law (PL) 84-660, "Water Pollution Control Act of 1956." At that time, the program was intended to be one of incentive grants, with a maximum grant of 30% of total wastewater

treatment plant (WWTP) construction costs (the 30% applied up to a total project cost of \$250,000). At this time there was no mandated comprehensive planning. The Federal yearly commitment was \$50 million total. There had been, of course, some wastewater treatment activity in some communities at the local level prior to this early federal program. While this study cannot review the history of local municipal planning and construction of WWTP facilities, we can note here that, generally, local treatment was primary (settlement ponds without secondary chemical treatment), and that some communities had no treatment. In Michigan we are reminded of the farmers out along the riversides who, finding dead, smelly ducks from raw sewage in the river, went to the Michigan State Capitol and dumped the ducks on the capitol steps, pressuring for local laws on water pollution.

The National Program in Water Quality

It was with the late 1960's environmental movement that significant changes in national and state environmental policy occurred. The National Environmental Policy Act of 1969 (NEPA) is the basic federal "charter for protection of the environment." With authorization established by NEPA and other Federal environmental statutes, the US Environmental Protection Agency (EPA) was formed. The EPA mission is to preserve the quality of the environment by the administration of environmental legislation, and by enforcing conformance with established environmental policies and procedures. Today there are "state EPAs" being formed also.³ The national EPA and the NEPA law exemplified an environmental version of the broader (1960s/1970s) "new federal model" described by Scott (1983). We could say that it represents a "third level of legitimation" following Berger and Luckman (1967, 94) (explicit theories by which an institutional sector is legitimated): it is as if people were saying in the late 1960s - "dead smelly ducks on the state capitol's steps won't do it, we need a federal redistribution of tax money back to the states with some roles set up and national legislation to do this." Yet while the 1960s social movements

helped to legitimate a national set of laws, much of the responsibility for the national clean water program was delegated to the states. To this story we now turn.

The Development of Clean Water Manager Positions at the State Level

Considerable action by Michigan's residents concerning water resources and water pollution as an environmental process has characterized "The Great Lakes State." With a landscape formed by recent glacial retreat (10,000 years ago), many lakes, rivers, streams, and, of course, four of the six largest freshwater bodies of water in the world are located in and around Michigan. With farm land to the south and glacial moraines (rolling hills) to the north, Michigan's history had included being an early recipient (1958) of the massive federal highway program. The efficient, new roads reflected the political power of Michigan to garner a public works project in the recession of that year and also the midwest interest in Michigan as a tourist and recreation area (which the new roads immediately facilitated).⁴ With beautiful inland lakes, rivers and streams and long sandy shores on the Great Lakes, a large farming industry, a significant population locating in (country and small town) rural homesites with strong rural values including hunting and fishing, and a booming tourist industry, notable conservation efforts are a part of this state's environmental protection process. In fact, the state has had a long history of concern with water quality, and a record of early enactment of permitting systems.

In 1913 the Michigan legislature enacted the Sewage Systems Act (PA 98). With this move, Michigan taxpayers were called upon to support the stipulation that the state exercise due care to see that the municipal sewage systems (WWTP) were properly planned, constructed, and operated so as not to pollute. The public law used language of "unlawful pollution" (of rivers, streams, harbors, lakes, and other water resources) and required that a construction permit be issued before any construction of a WWT plant was to commence.

In addition to the origins of the state level permit system, Michigan felt a general purpose commission was needed and sixteen years later PA 245 (1929) established the Water Resources Commission. In order to fulfill the objectives of PA 245, the Michigan Department of Natural Resources (MDNR) established a form of administrative law, ("The General Rules of the Water Resources Commission"), which addresses many issues and later played a part in the linkage of the early 1970s federal grants program roles with the state programs and water quality roles.

It should be noted that, as the country moved in the mid-sixties to environmental awareness, Michigan acted early to establish a financial aid program (PA 329, 1966) to encourage construction of adequate waste treatment and collection facilities. In addition, as the environmental sentiments built-up, the Thomas J. Anderson, Gordon Rockwell Michigan Environmental Protection Act of 1970 (PA 127) was passed. Urban density, suburbanization, and industrialism had leaped throughout the 1960s in a period of growth. Environmental consciousness, occurring in the general social movement context of the times, had reached a peak by the spring of 1970. Ecology had become a belief structure struggling with the technological belief structure - environmental action organizations (lobbies) worked hard. The nation was on the edge of a watershed period of crises for the values, norms, goals and strategies of the US environmental posture. A new "origins effect" for institutionalizing environmental organizations was occurring. Findings on American belief structures reported at the McKee "Social Issues Conference" at Michigan State University in the spring of 1991 revealed that there has been a shift in the belief systems: from a technological to an ecological paradigm (Dunlap and Olsen, see Olsen, 1988).

One way to approach "origins effects" is to capture the times in a brief conceptual scheme. We do that here with the contextual concept of a revised "new federal model" - an action (or program) bureaucracy. We mean to adopt Scott's (1983) five-step, general societal processes framework

(discussed in Chapter Two) in a way that is revised by data from our case to fit the environmental program as seen by the Michigan water quality role incumbents. We can move the story along by postulating that the available "explicit theory" (third level legitimation) was that "government should do something." The defense ("societal reaction") needed to clean up the water was a version of the public sphere - the "new federal model."

This defensive reaction took the form of a federal model of funding for the construction and remodeling (expansion) of WWTPs that moved beyond the 1956 incentive (30% of the costs) to major responsibility and federal initiative (with the federal level providing 75% of the funds). Newly created roles and reorganized and expanded MDNR units were mandated to make the program work. The Construction Grant Program was formed by the EPA as authorized in the federal legislation, PL 92-500, "Federal Water Pollution Control Act Amendments of 1972." The program began, as mentioned, with a grants policy of providing 75 percent of eligible cost for WWTP, interceptor, collection systems, combined sewer overflow (CSO) correction, and sewer separation with a minimum requirement that all municipal WWTPs achieve secondary treatment. The nation was set for one of the largest outlays of public expenditure outside of military spending in US history. Such massive expenditures (totaling over \$100 billion by 1987) required careful planning and specific roles in grants programs.

History of Environmental Management: The EPA and WWT after 1977

Many of the WWT plant and drain industry and regulation roles were, of course, direct delegations from the newly founded EPA in the 1970s and early 1980s. The EPA operates in a highly technical and controversial arena. Its policies and programs affect virtually all segments of the economy, society, and government. Charged initially with cleaning up pollution of the environment, with early emphasis on air and surface water, the EPA mandate in recent years has expanded. As a 1988 General Accounting Office (GAO) Report notes,

. . . its tasks (EPA) have become increasingly complicated as we understand more about the dangers and pervasiveness of toxic wastes and pesticides in the environment. The more recent emergence of radon, global warming, stratospheric ozone depletion, and indoor pollution as matters of environmental and health concern suggests that the scope and complexity of the agency's responsibilities will continue to increase (EPA: Protecting Human Health and the Environment Through Improved Management, GAO, 1988).

Against this background of evolving roles and responsibilities, the GAO reviewed EPA's management to identify ways the agency might improve its operational effectiveness. Founded in 1970 the EPA had an annual budget of \$5 billion and over 14,000 workers by 1988. A glance at the recent increasing complexity, scope, and evolving roles at the EPA reveals a picture that is mirrored at the state level. The states have assumed an increasingly important role, having been delegated operational responsibility for implementing most EPA programs. The roles at the state level are also increasingly complicated, increasing in scope and complexity with policies affecting virtually all segments as states have assumed an increasingly important role.

Grants Process

The Construction Grant Program as set forth by EPA, and the resulting State of Michigan program to implement and administer the EPA wastewater treatment program, represents one of the more comprehensive and complex processes to evolve in the public sector. It is also a process that has been changed and revised at both federal and state levels. This section presents a summary of how the system functions on a practical, day-to-day basis.

Each year the US Congress allocates a certain amount of dollars nationally to the US EPA Construction Grants Program. Sometimes a particular law will commit a specific level of funding over a several year period ("level-funding"). These dollars are split up and given to the various states on a predetermined formula based on needs studies that are submitted by each of the states. By this method each state is given a

certain amount of dollars each year to be given out in grants for wastewater treatment projects. This was, to repeat, a large program.

Near the end of the program (as of 1989) federal funding was still approximately \$2.4 billion each year with Michigan getting an approximate annual amount of \$105 million. Congress maintained this level through 1990 and then developed a change in funding the program - from grants to initiating a state revolving loan fund approach. The emphasis in the next four to six years (1992-1998) will be on a reduction or elimination of the federal grant program as the new loan program managed independently by the state of Michigan starts up.⁵ Our case study is an examination of the 20 year history of the grants part of the water quality program (1972-1991) just prior to the current period, although we also assess current (1992) demographics, work history and "occupationalness" attitudes of MDNR Surface Water Division workers.

While the social movement context influenced the passage of the major water quality laws, the local communities must work with the laws once they are passed. It is important, then, to have a basic understanding of the interplay between the various laws to realize the impact of the Construction Program on a community. The Clean Water Act of 1977 as amended (PL 95-217) provided the primary authority for preserving and protecting the quality of the nation's waters. Several aspects of this Act interplay with a wastewater project. These are Section 201, Municipal Wastewater Treatment Grants, Section 208, Areawide Waste Treatment Management, Section 402, National Pollutant Discharge Elimination System (NPDES) permit program, and Section 404, Dredge and Fill Permit program.

All wastewater treatment facilities constructed under Section 201 (the Construction Grants Program) needed to comply with other federal requirements in the Clean Water Act of 1977 (PL 95-217). Section 208 established Areawide Waste Treatment Management programs that identify anticipated wastewater needs for an area for the next 20 years. These plans also specified the relative financial requirements and required open

space and recreation opportunities. Wastewater projects funded through the Construction Grants program were required to be in basic compliance with the needs addressed in the 208 plans.

Section 402, the NPDES program, regulates the discharge of wastewater directly to the waters of the United States. Anyone who discharges wastewater directly to a regulated body of water must obtain an NPDES permit, and must be in compliance with the established effluent limitations as specified in the permit. The NPDES permit program was delegated to the State of Michigan in 1973, and such permits are issued by the Michigan DNR under the authority of Act 245 of 1929, and a Memorandum of Agreement (MOA) between the US EPA and the Michigan DNR. Under this MOA, state NPDES regulations must be at least as stringent as the EPA regulations.

Section 404 of the Clean Water Act regulates the discharge of dredged or fill materials to the waters of the United States, including wetlands adjacent to such waters. The primary significance of Section 404 is usually associated with the regulation of projects that could affect wetlands or aquatic ecosystems, or could cause the destruction or modification of biologic habitats. The 404 program is administered by the US EPA and the US Corps of Engineers. However, issuance of 404 permits has been delegated to the State of Michigan. In addition to the 404 program the Corps of Engineers also has jurisdiction over Section 10 of the Rivers and Harbors Act. This permit program regulates the placement of structures in navigable waters and could be necessary for a wastewater project. The responsibility for issuing this permit has also been delegated to the State.

Three other State of Michigan Acts at times interplay with proposed wastewater projects. These are the Inland Lakes and Streams Act of 1972 (Act 346), the Goemaere-Anderson Wetland Protection Act of 1979 (Act 203), and the Great Lakes Submerged Lands Act of 1955 (Act 247). Act 346 addresses dredge, fill, and construction projects at or below the ordinary

high water mark; Act 203 pertains to activities in wetland areas; and Act 247 addresses the filling in of submerged lands and construction of structures in the Great Lakes.

It was important for the grants unit project manager to have a basic understanding of these various laws and regulations so that they could be reviewed with a community during the preliminary discussions leading up to involvement of the community in the Construction Grant Program. Even in the absence of EPA funding on a wastewater project, many of these various laws still pertain to a community's proposed project.

Three Basic Steps in the Grants Process

The construction Grants Program consisted of three basic steps, as follows:

Step 1 - Facility Plan Preparation

Step 2 - Design

Step 3 - Construction

Step 1, the Facility Plan, was a comprehensive planning and engineering report, addressing the existing problem, alternatives for solution to the problem, and recommending the most cost effective solution, including the environmental impacts of the solutions. (Many of the planning functions will remain in the current loan program). Step 2, the design phase, was the preparation of detailed construction plans and specifications necessary to build the proposed project. Step 3, the construction phase, is the building phase of the proposed project.

Previously, a community could receive a grant for preparation of a Facility Plan. However, those grants no longer exist and a community must now finance these studies with their own funds. Step 2 and Step 3 grants were given independently or might be combined if the community had a population of under 25,000. These combined grants were referred to as Step 2 & 3, or sometimes they were called Step 4 grants.

A community first got involved in the Construction Grants program when they realized they had the need for a wastewater project. They might

contact the Department of Natural Resources and be directed to the proper person, most likely someone in the Community Assistance Division (Municipal Facilities Section), our case study site.

Listed below are the basic steps that followed this initial contact, if the community proceeded into the Construction Grants Program.

1. Preplanning Meeting
2. Plan of Study Area Determination
3. Preparation of Facility Plan
4. Approval of the Facility Plan and Placement on the Priority List for Funding
5. Receipt of a Step 2 & 3 Grant
6. Completion of Construction Plans and Specifications
7. Completion of a User Charge System
8. Construction of Project
9. Project Closeout

Priority List

Each year the State of Michigan Department of Natural Resources formulated a priority list for funding wastewater projects in Michigan. This list was used as a basis for awarding Step 2, Step 3, or Step 2 & 3 grants to eligible communities. Priority points were assigned to various categories such as a discharge flow, drought flow of receiving stream, designated use of receiving stream, population, and so forth. Funding was then allocated to communities whose projects were ready to be funded, in the order of the list. This procedure will change in the current evolution into a loan program.

In the Grants program a certain portion of the State's total allocation was set aside for innovative and/or alternative technologies, and projects qualifying for these funds were ranked separately.

In order to better manage the Construction Grants Program, and the Municipal Facilities Administration Section (of Community Assistance), the

program developed a Priority List Management Plan. The plan established milestone event dates so that Michigan DNR staff and the applicants could monitor where they were in the program. (A few municipal WWT projects are still following out the "final plans" of the now defunct Grants Program, for example, the planning for the City of Lansing "final plan" was just completed in the fall of 1992). There were many examples of such procedures designed to manage such a comprehensive and complex organizational process as the sets of temporary projects that the grant program administered, all aimed at achieving common goals.

Delegation Agreement and Responsibilities

The US EPA had the authority to delegate the management of the Construction Grants Program to a state under Section 205(g) of the Federal Water Pollution Control Act. The first comprehensive delegation between the US EPA and the Michigan DNR was signed in 1979. This original delegation agreement was developed on the basis of the determination that the Michigan DNR had the requisite management capabilities to administer a construction grants program consistent with: (1) the intent of Congress under the law; (2) the need to decentralize program management; and (3) demonstrated State abilities for prudent fiscal management. (The EPA maintains an Office of Inspector General which in the past has monitored and audited Section 205(g) grants programs). The most recent renewed delegation agreement between US EPA and the Michigan DNR was executed in 1985.

The delegation of much of the activities from US EPA in Chicago Region 5 headquarters to the State was advantageous to Michigan in that it increased the participation in the program by the DNR staff, thus allowing the opportunity to keep decision making during this period closer to the communities. This delegation involved making state DNR and Grants Units administrators responsible parties.

The delegated management commitments to be performed by the State of Michigan Community Assistance Grants Administration Unit were as follows:

1. Administer the Construction Grants program in accordance with federal rules, regulations, orders and policy statements.
2. Incorporate changes in federal rules as they are promulgated.
3. Integrate state rules, regulations, orders, and policy statements with federal directives.
4. Provide adequate staff and supervisory resources.
5. Re-evaluate staffing on a continuing basis and make adjustments as necessary.
6. Assume responsibility for maintaining the grants information and control system (GICS).
7. Carry out the tasks of the delegation agreement with construction management assistance grant funds.
8. Develop checklists and review summary sheets for carrying out delegated tasks.

The non-delegated items that remained the authority of EPA can be summarized as follows:

1. Formal grant agreements and amendments, grant withdrawals, terminations, annulments, and grant payments.
2. Final determinations of certain federal statutes and executive orders.
3. Project audits and final resolution of audit exceptions.
4. Procurement system review and protests.
5. Projects where an overriding federal interest requires greater federal involvement.

The State of Michigan received funding from EPA for carrying out the delegated tasks in the delegation agreement. In order to maintain this funding, the State agreed to a level of effort necessary to maintain the program. Good record keeping of items relative to the Construction Grants Program was also essential.

Good record keeping was also very important since the Michigan DNR maintains the official federal project file. This file consisted of documentation from grantees, review memos, checklists, and other similar records. The records were required to be able to produce an audit trail for all events within the scope of a particular project.

Division Responsibilities

A key to the success of the Grants Program, and the Wastewater Program in general, has been the considerable cross-division communication and coordination required. This complex coordination requires an understanding of division responsibilities, a coordination between divisions (Surface Water, Ground Water, Great Lakes, Toxics, etc.), and getting to know key individuals in other divisions. An ongoing effort to improve the coordination of activities within water quality management programs and between the various other state programs efforts became more important as the program (and the environmental problems) became more complex. This effort included such things as furthering communications, participating in the development of new procedures, and providing mechanisms for the timely input of public comment into the decision making process.

Contact outside the DNR, with the WWT interorganizational "field", involves the formation of a "project team." As a key link player, the grants process project managers worked with many individuals including usually the City Manager, Village President, Clerk, or Supervisor of the municipality. One of these persons was required to be officially designated as the "grantee representative." If there was an existing wastewater system in the community, the wastewater superintendent was also be a key player all the way through the project. There was also a consulting engineering firm and usually one person from this firm was the primary contact. (The role of consultants will persist in the loan program). The consultant was one of the key players on the grant project team since he or she was responsible for the majority of the documentation necessary to be submitted, including the formal Facility Plan, other plans and specifications, user charge systems, contact for review and guidances from the Grants Administration unit project managers, and so forth.

Other contacts outside the DNR with the WWT organizational field included interaction with a local attorney and bond counsel who were

involved in coordinating legal activities and sale of bonds, if necessary. The Corps of Engineers will also have involvement in the project, usually from several perspectives. They may have initial involvement from the standpoint of 404 or Section 10 permits. They also were reviewing construction contract documents concurrent with the DNR review. Finally, the Corps of Engineers has the responsibility during the construction phase, to monitor construction for the US EPA. Another member of the project team may be a representative of another funding agency who has funds committed to the project (eg., Tri-County Regional Planning Commission, Southeast Michigan Council of Governments, known as SEMCOG, the County Drain Commissioner, etc.). Sometimes this other agency also has review responsibilities, particularly for plans and specifications. And, of course, in such large dollar projects local and state political officials often are involved.

Clearly it is very important that the key players of the large dollar, complex WWT project team know of each other and understand the responsibilities of each player. In a later section we will make some preliminary examination of the emerging interaction between the incumbent role players on a project team and their set of organizations as the build up of an organizational field, or "societal sector," and ask how this might have contributed to the emergence of occupations for the grants project managers and other Surface Water roles. For now we list below the section responsibilities which were the job description of the Grant Administration water quality project manager role during this period. These responsibilities were, in summary, to:

1. Develop the State Water Quality Management Plan;
2. Provide liaison and coordination with regional water quality management planning agencies;
3. Assist other units of state government in obtaining Section 208 grants;
4. Provide leadership and assistance in the design and execution of water quality management (WQM) planning projects;

5. This includes liaison work and guidance to all project team members: city officials, plant superintendents, consultants, district staff, Corps of Engineers, EPA;
6. Review and approval of certain delegated program activities;
7. Provide administrative functions including coordination of reviews, processing of reviews, processing of grants, liaison activities with EPA, eligibility determinations, interpretation and application of rules to special cases;
8. Review and certification of grantee submittals;
9. Serve as resource person to other divisions of the project team concerning Community Assistance Division and EPA involvement;
10. Participate in EPA audits;
11. Maintain the official project file;
12. Certification of projects to EPA.

Major responsibilities of the entire Surface Water Quality and Groundwater Quality Division are listed below. (District staff will also get involved in other activities pertaining to specific problems within the wastewater program).

1. Review and approval of technical portions of facilities plans.
2. Review and approval of infiltration/inflow analyses and sewer system evaluation surveys.
3. Review of change orders, addenda, and engineering studies.
4. Review and approval of hydrogeological investigations.
5. Issue Act 245, Act 98 and NPDES permits, along with other enforcement activities.
6. Evaluate projects against goals and limitations set forth in permits and other enforcement actions.
7. Advise Project Team of special, unique conditions that exist in project area, including political climate, interest groups, financing problems, enforcement/compliance history and industrial, commercial, residential exceptions.
8. Advise consultants of these same conditions.

9. Ramrod potentially difficult/time delaying portions of the project, such as local share financing, cost effective-ineligible portions of the project, putting teeth in Sewer Ordinance and rate increases.
10. Keep abreast of Industrial Pretreatment Program needs in a project area.
11. Process Sludge Management Plans (PERM's, etc.).
12. Prepare effluent limits for wastewater discharges.
13. Transmit effluent limits to district staff for active Construction Grant's projects.
14. Update effluent limits as necessary. (Five year cycle for reissuing permits or water quality rule changes).
15. Recommendations for control of non-conventional pollutants, such as additional treatment requirements and special laboratory needs.
16. Special studies and evaluations requested by Districts on stream studies, modeling, chlorination, dechlorination and CSO control.

Additional responsibilities related to WWTP plans, design and construction involve the Air Quality Division, as follows:

1. Comment on facility plan.
2. Furnish information on ambient air conditions.
3. Concerns for fugitive dust control program during construction.
4. Control of odors from facilities.

We have discussed many of the general functions of each unit within the Community Assistance division as of the late 1970s and 1980s. Within the division during that period there were six units: facilities planning, water quality management planning, grants administration section, municipal design review section, training and certification section, and the wastewater operations section. The general functions of each unit or section within the former division have been indicated. (The Community Assistance Division was reorganized as the Municipal Facilities section within the Surface Water Division in the late 1980s). The primary focus of our case study, however, is on the history of the work roles in the grants

administration section. The excerpt below summarizes the method of operation and gives a summary of the grants unit:

It is the responsibility of the Grants Administration Section to administer the state and federal Construction Grants Program to provide financial assistance to municipal, intermunicipal or interstate agencies for the construction of publicly owned treatment works to abate pollution discharged to the waters of the State. Publicly owned treatment works refer to various treatment facilities including wastewater treatment plants, collection sewers, interceptor sewers, sewer system repair (rehabilitation) projects, community septic systems, etc., which are owned and operated by a municipal, intermunicipal or interstate agency. The construction grant process consists of three steps (facilities planning, design, construction).

The construction grants program is a lengthy and extremely complex program. Since April, 1978, the State has assumed authority to review and certify a majority of the grant program documents and to perform grant program management tasks in accordance with the 205(g) provisions of the Clean Water Act, its implementing regulations, and the Delegation Agreement between U.S. EPA and MDNR. Administration and coordination of these functions are vested primarily in the Grants Administration Section (GAS). However, the extensive regulatory requirements in the process require interactions between numerous groups within the Department of Natural Resources as well as interactions with local agencies and other State and Federal agencies (Michigan Water Quality Plan, DNR, 1981, 74-77).

History of the NPDES and the Grants Program: A Clean Water Success

As we look back on the rise of the federal grants program from an incentive (1956) to a major "new federal model" (1972-1991) we want to note that water quality is the success story of US anti-pollution efforts. The EPA delegation of responsibilities to the state water quality roles (backed up by a strengthened permit process, mandated comprehensive planning and 75% of project monies redistributed through the federal level to the local project) worked - the grants program is a model of success. As a major national magazine summarizes:

. . . Dangerous chemicals discharged to waterways equal less than one-fifth the amount pumped into the air according to

EPA figures. Drinking-water supplies, though in places imperiled, are in the main safe. The most disturbing ecological image of the 1960s - junk pouring directly into a stream - is history thanks to the National Pollution Discharge Elimination System (NPDES). Under the NPDES any "point-source" pumping fluids into a river or lake must obtain an easily revoked permit specifying what the discharge can contain.

Because point sources are fairly easy to spot, the NPDES has stopped most deliberate pollution of water bodies.

Payback has come quickly. Water quality in the Great Lakes, Chesapeake Bay and elsewhere is on the rebound. Lake Erie, pronounced dead in the 1960s, is looking lively. Infamous "flammable rivers" such as the Cuyahoga are no longer threats to ignite; channels like the Potomac are close to being swimmable again (Newsweek, 7/24/89, 35).

The Newsweek essay notes that such rapid recoveries indicated first the resiliency of the ecology (which, given effective programs will "bounce back") and second, that fast recovery of water bodies stands as a political lesson about environmentalism:

. . . that it's a tunnel with a bright, cheery light at the end. "In so much of politics you have no idea whether you are doing any good," says Paul Levey, head of the authority building the Boston (WWTP) system. "Ecological control produces visible, satisfying results. Nature can't recover until you stop polluting. But once you do she works amazingly fast." (ibid., 35).

Of course, the better the water treatment the worse the sludge problem becomes. What to do with the sludge (the settlement of the particulates and chemicals at the bottom of the ponds in wastewater plants) has become problematic. Also today just 9% of current stream pollution comes from (point-source) industry. Fully 65% is non-point, primarily from agricultural runoff. The work of this "amazingly fast" recovery was accomplished by the newly created or expanded water quality roles, such as the Grants Administration project managers. To tell the occupational story of this clean water success story is to look at the historical, cultural and structural phenomena influencing the clean water manager positions and their incumbents at the state level. In assembling this story, additional documented history from libraries and manuals, many state level documents on EPA nonbinding delegations, civil service histories, changing job descriptions, interviews and biographies were reviewed.

Part of this transition from the mobilization phase of a social movement to partial institutionalization of labor market positions in environmental work is the story of how that work has been a part of an emerging organizational field: the rise of an environmental "interorganizational network" or "societal sector" (Meyer & Scott, 1983) in a changing "federal model."

An Emerging Organizational Field

The interorganizational network that emerged with a new "public policy regime" (Dobbins, 1992) was instituted with the 1972 Clean Water Act. Now comprehensive planning was required and this involved new roles. As amended in 1977 this new "public policy regime" involved: a project team consisting of local officials, consultants, the MDNR Grants Administration project manager, and often a local wastewater treatment plant superintendent. As mentioned, this political, engineering, and environmental "project team" also interacted with state officials, local construction companies and developers, the Army Corps of Engineers, and the EPA. As a large dollar public works project, wastewater treatment plants and drain systems implicate (or brought together) power, money, growth, jobs, and environmental management into one societal sector. What is the nature of a societal sector?

One way to grasp the nature of a societal sector is to look at other examples. In Sweden, after World War II, a certain pattern emerged with regard to the building of dams. The national legislature wanted a method to earn foreign exchange on the world market. The export of aluminum provided an answer. The bauxite needed processing which required massive amounts of electricity. A Power Commission was formed to facilitate the building of dams on the rivers leading to the fjords. The social-Keynesian policies of full employment linked into this emerging project by way of the construction unions, which appreciated the massive works projects. The builders, developers, and private construction companies supplied an entrepreneurial and industrial component, and were glad for the assured

market. The communities near the dam projects appreciated the added business and gave political support to the legislature to continue the strategy.

What had developed in Sweden was an interorganizational field where each unit contributed to the function: build-dams-process-bauxite-into-aluminum-earn-foreign-exchange-make-jobs-keep-social-Keynesianism-going-get-reelected-make-money. Each part was interconnected as an interorganizational field within the industrial system of dam-building in Sweden. Today organizational theorists prefer the phrase "emerging organization field" to sector or industrial system.

The central problem addressed is that the structure of an organizational field is taken to be an important aspect of the environment of a constituent organization. Within this view (a community ecology of organizations perspective) the main locus of rationality is in the sector itself, not the focal organization (which may also have its own "assumption of rationality," but which must operate within the function of the sector and in terms of its rationality to be a member). In the wastewater treatment plant and drain "societal sector," as mentioned, several organizations participate as an organizational field: local community or city administration officials, WWT plant superintendents, local, state and federal politicians, consultant companies, construction firms, developers, the Army Corps of Engineers, the regional EPA, creating a growth-jobs-politics-environmental management type of sectoral phenomenon similar in overall interconnections to the Swedish dam building sector, although with a stronger environmental movement-influenced planning dimension.

Water quality specialists and their work in carrying out EPA guidelines and in helping to establish state water management processes provide then, a occupational event in the unfolding of the environmental movements influence on organizational forms. As these new positions interacted within the emerging organizational field their planning and

regulatory role had its impact on organizational learning (Levitt & March, 1988). The "technology" of the grants planning process, as a new environmental institution of 205(g) comprehensive planning, helped insert an environmentalist role in the growth coalition. As a conflict role certain problematics of "institutionalization" within the mandated organizational field will be reviewed in section 4. However recent literature on water management institutions has emphasized the difficulties in achieving comprehensive planning. (See, for example, Viessman, 1988).

In our general review of the natural history of the emergence of environmental management water quality occupations, the WWT grants program project manager and associated WWTP and drain system design, financial and water quality specialist roles enacted a specific "clean-up-the-water-do-more-comprehensive-planning-of-WWT-monitor-the-grant-money" role (as distinct from organization). Social movements, new institutions, and new technologies all seem relevant for this new "public policy regime," labor market position. As a type of work, these roles guided the rebuilding of WWT plants, the construction of new plants and drains, and the construction of other WWT systems to new permit standards of water quality instituted by the Clean Water Act of 1972. As we will see in the next section, certain types of mutual interactions within this "societal sector" (interorganizational field or network) appeared to be occurring which are hypothesized to contribute to occupationalizing. And the growth of ecological knowledge itself created new bases for occupationalizing with the expansion of a technical capacity for measurement which fed back into new standards for permits. There was a growth of the knowledge base during this period. Yet part of that growth of knowledge was pushed by the social movement and its cohorts. A missing occupational form in recent literature has been the case of the institutionalization of social movements. In summary, the conditions and processes related to such

phenomena include movements which enact roles in an emerging mandated organizational field. Within this sector many interactions were occurring.

Summary

Early state legislation established a unit in the DNR and various agencies. Early federal legislation (1956, 1965, and 1969) and the formation of EPA (1970) and the Clean Water Acts of 1972 and 1977 established or institutionalized many new jobs. It is our hypothesis that these jobs have subsequently been undergoing "occupationalizing." Some generalizations about environmental managers to be presented from our research lends credence to this assertion. The origins effect time period for this occupationalizing occurred between 1965 and 1977 for both the national situses of environmental management and the local state WWTP roles. However, for our case-study of WWT Grants program roles, much of the "new job" (or occupation-forming) history occurs in the period 1977 to the present.

This history can be interpreted in terms of organizational ecology and the study of "origins effects;" in terms of institutionalist perspectives on organizations (rational myths) and organizational culture; in terms of perspectives in organizational theory on basic societal processes (Scott's federal model); in terms of social problems processes; and, of course, in terms of social movement analysis. The interpretation of this history suggests the development of a social movement institutionalized occupational labor market (SMIOLM). The history of water quality roles also suggest their potential for further "occupationalizing." As we trace the interaction of the emergence of the new occupations in the context of traditional state and federal civil service internal labor markets (ILMs), additional theoretical questions will be addressed. By various methods of analysis we may be able to contribute an outline of the similarities and differences between social movement and non-social movement occupations. Since the environmental movement continues into the present and, if anything, seems to be growing,

what is the outlook for these "occupationalizing" trends? What is the outlook for the "program professional" doing environmental work? Questions of this kind are addressed in the next section.

PART IV: ESTABLISHING POSITIONS, ORIGINS EFFECTS AND EMERGING OCCUPATIONALIZATION

The impact of the environmental movement may be seen to have transformed water quality organizational activity over the last thirty years from a relatively "closed rational" to an "open natural" environment (See Scott, 1987; Killman, 1983). Beginning around the early 1960s work within governmental regulatory systems became more open to social movements and increasing public demands (See Scott, 1987, 114; Terryberry, 1968) leading to an emerging organizational field of regulation. In short, the "causal texture of the environment" for water quality work in these new interorganizational relationships became more turbulent (Emery & Trist, 1965). We have outlined a three-step model of clean water manager labor market positions emerging within this new organizational field of environmental regulation and, in our focus on the occupationalizing of the many new, or altered roles, have presented eleven central research questions. We now turn to a discussion of these research questions and present the results of the research.

STEP ONE: ESTABLISHING THE POSITIONS

The partial institutionalization of environmental movement goals into the enactment of legislation, positions, and organizations suggests a context that raises three key research questions: 1) the influence of the environmental movement on the initial positions, 2) the influence of the environmental movement on the initial incumbents, and 3) an interactive question - the extent to which the emergence of the initial position and characteristics of the initial incumbents may have influenced the environmental movement.

Where jobs are created by the partial institutionalization of a social movement it is clear that in addition to the potential ongoing

fervor and non-institutional or anti-institutional sentiments of that social movement "outside" the established (or institutionalized) social order, certain labor market positions may be instituted "inside the social order" and certain incumbents enter these newly established initial positions. Once established these initial positions and their incumbents, in turn, may affect the ongoing social movement. What are the issues requiring discussion in these three research questions? What kind of data can our study bring to these questions?

Research Question #1: How did the environmental movement influence the emergence of the position? (movement effect, institutionalization effect)

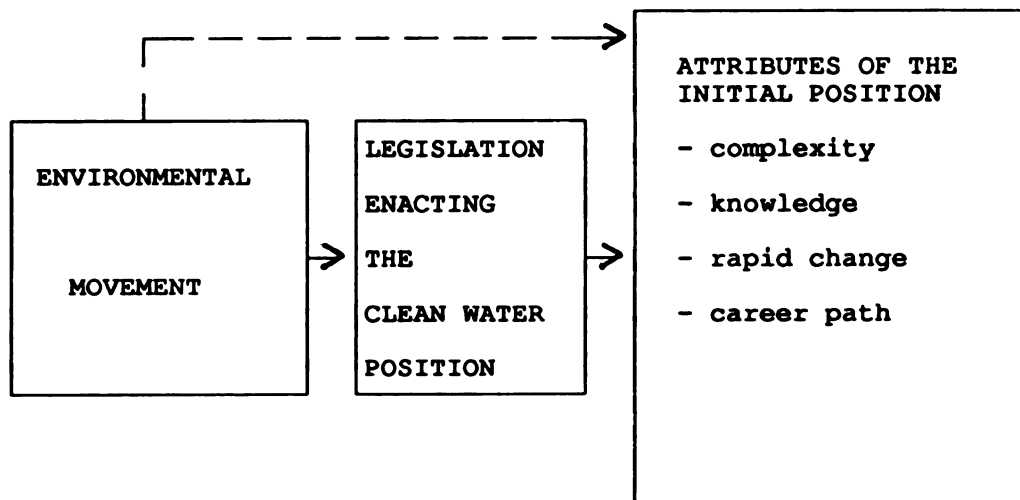
Introduction

Part of this question is to ask the degree of influence of the environmental movement on the character of enacted environmental legislation, and part of this question is to ask to what extent the environmental movement influenced the initial clean water management positions. A modification in our general causal model (Figure 1, 22) is required to include the influence of the environmental movement directly on the attributes of the new (or altered) positions. This is shown by adding the dotted line in Figure 4, below.

We need to separate these two questions because, while the legislation was new (Clean Water Acts of 1965, 1969, 1972, 1977), the positions might be seen as standard "bureaucratic hats" (eg., project manager, or permit compliance and enforcement specialist). At issue here is the institutionalist thesis that a great deal of new or movement effects generally become subject to old or already institutionalized "rational myths", "institutionalized scripts", or general societal rationalizing processes.

However, social movements tend to create "open environments" (Astely, 1985) and, in these conditions, "niches" do not pre-exist, waiting to be filled (as in some of the population ecology view of organizations.) Such social movement institutionalized occupations are

Figure 4. Influence of environmental movement on emergence of the attributes of the initial positions.



not solely a product of the market power of pre-existing social forms, that is of professional groups vying over work jurisdictions as a "system" of professions with the "currency" of abstract knowledge (Abbott, 1988), since they are new positions. New PISMO jobs may materialize, then, as the product of new organizational action (McKelvey, 1982, 109), and new occupational action (Bucher, 1961).

Discussion

Blum, et. al. (1988) note that new social movements around alcoholism as a disease and quality of work life in the employee assistance field helped institutionalize the "occupational program coordinator" positions within corporations and firms during the early 1970s. This influence of social movements was also, of course, the case for many environmental manager roles. During the 1965-1977 period in the United States the environmental movement influenced legislation, helping to shape emerging cleanwater roles. The environmental movement mobilization stage helped establish the Clean Water Act (1972) and made possible a vastly enlarged wastewater treatment plant (WWTP) and drains

grants program - the federal construction grants program. The WWT sector was effected by this "mandated coordination" (Aldrich and Whetten, 1981).

The "open environment" for an expanded WWT interorganizational field was not there before the generalized belief (or change in consciousness) of the 1960s toward needing action, which then led to the creation of the new legislation and the new environmental jobs. Once this large-dollar, federal program was initiated, the building of WWT plants and drains was at the center of an intricately interrelated political, growth, and regulation infrastructure which provided a "series of direct working relationships between organizations" as symbiotic partners (Hawley, 1986; Astely, 1985, 236). The WWT cleanwater role becomes a key link in the emerging organizational field. The "bureaucratic hat" type of roles (project manager, etc.) were taken from government-standard-issue job descriptions, but as we have emphasized in our modified causal model the social movement dimension of their establishment may have influenced the nature of these positions. That is our research question. To answer this question we need to review collective behavior and social movement theory once again.

The Rise of a Generalized Belief in a Social Movement

How does the belief arise in a social movement that new labor market positions are needed? The answer, in the view of Neil Smelser (1962), is that a "new position" may be part of the collective behavior step of making the situation meaningful and specifying a possible or appropriate response. According to Smelser, collective behavior proceeds through a six step "value-added" model. Each step is a necessary (and cumulative) step for the next step, and only all six steps are (both necessary and) sufficient for an episode of collective behavior. These six steps are: 1) structural conduciveness, 2) structural strain, 3) growth and spread of a generalized belief, 4) precipitating factors, 5) mobilization of participants for action, and 6) the operation of social control.

We have described a federal model of national permit standards, federal money and delegation of program responsibilities to new positions at the state level as "third order legitimation," that is, as a socially constructed theory of how an institution works (following Berger and Luckman, 1967). In this case the institution may be labeled the 1960's/1970's "new federal model" (which includes the general societal rationalizing processes identified by Scott and Meyer, 1983). While we may posit, in the theory of collective behavior, general characteristics of industrial society to provide steps 1 and 2 (structural conduciveness and structural strain) in the form of pollution, it is step 3, in Smelser's model, that may provide us with an answer to our question of whether the new positions were merely "bureaucratic hats" or were beginning new work jurisdictions influenced by the environmental movement. The environmental movement influenced the emergence of clean water manager positions initially in establishing a generalized belief: a vision of people in environmental jobs that are part of a clean water program. This program would be a state and federal program to do something about that which needed reform.

As Smelser says,

. . . Before collective action can be taken to reconstitute the situation brought on by structural strain, this situation must be made meaningful to the potential actors. This meaning is supplied in a generalized belief, which identifies the source of strain, attributes certain characteristics to this source, and specifies certain responses to the strain as possible or appropriate (Smelser, 1962, 16).

In the mobilization stage, then, the environmental movement brings about the lobby groups, who then go into action, agitating for reform. To what features of the society are environmental movement reform agitation directed? Has this influenced the nature of the new positions? How have the different phases of the environmental movement influenced the emergence of the new positions? What different types of movement identities are blended, as influences, on the emerging positions?

The History of the Environmental Movement

Schnaiberg (1980) observed that, in acting on issues of environmental protection, society (and the environmental groups) needed a "fuller understanding of the origins of ecosystem disorganization." The answer, in his view, is that general underlying elements of social production and cultural orientations, that is, the sociocultural production system, has followed (or changed toward) an ecosystem disorganization course because of:

- . . . (1) population growth, (2) technological imperatives,
- (3) the desires of increasingly affluent consumers, and
- (4) the organizational features of producers (Schnaiberg, 1980, 43).

During the 1960's demonstrations, protests and some early legislation characterized the environmental movement. But, by the early 1970's, this earlier form of collective behavior (protests) had been to a great extent transformed into "institutionalized conflict." Schnaiberg observes,

. . . By institutionalized conflict I mean the interaction of organized elements of the environmental movement with major sociopolitical institutions such as the courts, Congress, executive agencies of the state, and labor unions. This contrasts with the other forms of collective behavior that are more visible and dramatic . . . prevalent in the 1960s' (Schnaiberg, 1980, 394).

It was in this reformist phase that the environmental movement experienced, in mobilization for laws, programs, budgets and positions, both institutional support for reform and institutional resistance to reform. Part of the institutional support for reform came from the influence of the "new federal model" of the times (Scott, 1983) which facilitated the transition of the movement from protest to power. Schnaiberg described (as of 1980) the evolution of the environmental movement in this way:

. . . First, this social movement rose in the late 1960's from a modest base to a fairly large one. Its public support base has since tapered off somewhat. Second, even at the peak of environmentalism, roughly during 1968-1970, there was substantial opposition to many components of a broad environmental protection ideology of the movement, and this opposition has increased in recent years. Third, the major social group supporting the movement was the middle-to-upper-middle-class segment of the American population. In particular, the movement found its strongest support within

the white, educated, white-collar stratum. Fourth, the movement has gradually changed from a "participatory" to a "power" strategy in dealing with conflicts around environmental issues. While public-education campaigns have by no means disappeared in recent years, the core of the active environmental movement today is focused on litigation, political lobbying, and technical evaluation rather than on mass mobilization for protest marches, petition-signing, and the like (Schnaiberg, 1980, 367).

Schnaiberg observed that part of the 1960's and 1970's movement grew out of "an organizational matrix" of voluntary organizations connected with conservationism and preservationism. These earlier orientations had some relationships with the existing (institutional) framework of "distinctive state agencies concerned with various kinds of land control and, to a lesser extent, some forms of pollution." Were the new "environmental" positions that have emerged since just a numerical increase of the same type of labor market position? Had the "rational myth" script of state agency water-related jobs already been written? Schnaiberg emphasizes that the preexisting social movement organizations (and by implication the state agency labor market positions) were primarily oriented toward habitat issues with a cosmetic and meliorist orientation and did not constitute a coherent environmental movement oriented toward sustenance:

In the late 1960's, though, a new mass consciousness of environmental issues appeared. These issues were heavily weighted toward sustenance concerns, in the extreme toward "survival." This mass base formed a moral protest movement, with concerns about the status risks of environmental degradation. Resulting status politics (Gusfield, 1963) created a moral crusade against extravagant consumption and production. Middle-class predominance, and involvement of educated professional groups with a self-interest in expanding public service jobs in environmental protection, is not atypical:

The question of the nature of social movement identities was also addressed by Schnaiberg (1980). He noted:

Turning back to the analytic history of the movement, it appears that in the early period the base of the movement was composed mostly of cosmetologists and meliorists. This both stimulated and was reinforced by strategies that aimed at mass consumer education. During the latter part of this period, ecological perception had deepened. Meliorists and reformists formed a larger part of the movement, which shifted toward legislation and litigation.

. . . By the early 1970's, most cosmetologists had dropped out, some meliorists had either dropped out or become reformists or even radicals, and reformists and (to a lesser extent) radicals began to constitute the bulk of the movement. Confusion and disorganization of this period was partly due to the loss of consumer-oriented participants, and the ascendancy of production-oriented groups such as the reformists. To some extent, this confusion was also between value orientations and prescriptive behavioral norm-orientations within the movement - or between changes in "people" and institutions. Moreover, the radical component of the movement was disillusioned with the small production changes imposed by NEPA and related Acts. . . In contrast, reformists had the task of dealing ever more directly with representatives of major production interests in their efforts to seek enforcement of existing legislation and new legislative mandates . . . (Schnaiberg, 1980, 376).

Schnaiberg concluded that, as of 1980, the core of the environmental movement had become reformist, with key participants in paid professional roles such as lawyer, ecologist, or community organizer. The adversarial process had become a process of negotiation (Schnaiberg, 1980, 377). Reviewing several 1970's environmental actions, Schnaiberg noted that the movements followed middle-class political strategies. Daily time and energy constraints inhibited mobilization of working class participants. Resulting actions exemplified moral protest movements, with a "sine qua non that deliberate physical force strategies should be rejected" (Wilkinson, 1971:118). And they reflected "the mystique of expertise . . and belief that the middle class is more capable of judging distant events" (Ash, 1972:211) (Schnaiberg, 1980, 386).

In summary, the environmental positions created at this time (1965-1977) in the public sector - e.g., the clean water managers - were filled by initial incumbents influenced by an environmental movement that was a complicated blending of cosmetologist, meliorist, reformist, and radical identifications; included a tension between norm-oriented and value-oriented generalized beliefs; had undergone a series of shifts in the actual coherency and history of the movement itself - from moral protest and mobilization to institutionalized conflict; and had an increasingly specific history of the "marks" of a norm-oriented movement: legal reforms, programs, budgets, court decisions, and enduring environmental

management labor market positions. To establish an influence of the environmental movement on recent water quality positions a thorough review of the history of U.S. water policy is required. Our case study can add to this lengthy general historical discussion some additional, brief survey and intensive interview results.

Historical Review of U.S. Water Policy Organizations and Roles

Specific laws founded the position in our case study and we have described the details of the work jurisdiction of the grants program and its job descriptions in our general history. It was the environmental movement that pushed for these recent laws. However, in order to situate the influence of the recent environmental movement, and distinguish its continuities and differences with past policy, programs and positions, a thorough history of U.S. water policy is required.

Overview. Overall, U.S. federal water policy has had three phases: development, coordination, and regulation. The development phase in the early days of the new nation encouraged settlement and development, involved navigation (canals, dams, dredging and locks), and included flood control and hydroelectric power. This early period led to a second period, the coordination phase. By the late 1930s and 1940s federal level activities had reached such a stage that problems of coordination became paramount. To reduce overlaps, competition, and conflict, various policy commissions and interagency coordinations took place, and this continued throughout the 1950s. However, by the early 1960s, a third phase was beginning, the regulation phase. The regulation phase was

. . . ushered in by the emergence of the national environmental movement in the 1960's. Shocked by a series of revelations about particular instances of environmental deterioration - for example, wetland drainage, water pollution, pesticides, mercury contamination, and the Santa Barbara oil spill - the public rose up as never before to demand tough regulatory action (Foster & Rogers, 1988, 35).

Clearly the environmental movement of the 1960's influenced the emergence of many recent positions in water quality - it pushed to create

roles to help in effecting a comprehensive plan: clean up the water. However, water is a free flowing hydrological cycle and has no respect for political boundaries. Watersheds and river basins are the naturalistic units. The institutional units should stick to watershed boundaries, but don't. Instead, when the Clean Water Act of 1972 set up the major water quality positions, they were set up in a modified new federal model working at the federal level and in state political jurisdictions. The environmental movement was the public presence for planning basin-wide and creating new monitoring positions, but the new jobs were set up as delegations of authority and responsibility to the state civil services. Part of the complexity of water quality work, then, is getting political units within and between states to work together. An understanding of this complex political jurisdiction history is needed to understand the nature of the new positions.

In conclusion, it can be noted that the environmental movement was strong enough to get a new federal water quality program going, but that this strength was channeled and shaped by the institutional environment of US federalism and its institutions. New river basin and watershed institutions were rare, difficult to establish, and precarious in contrast to traditional institutional federal and state organizational forms.

The influence of the environmental movement was shaped, then, by the historical, cultural and network exigencies (Scott, 1983) of the US in the 1960's and 1970's period. However, the newness of the environmental movement was that it called for environmental planning. Water had always played a role in the economic and federal/state system. In the name of economic expansion water is a demand. Politicians earned points bringing in pork barrel projects in water resources. And public works water projects are large dollar impacts for local areas. The Army Corps of Engineers, the traditional social institution for water projects, looked at problems through the eyes of engineers - as problems with potential physical and technical solutions. The call for environmental planning in

the 1960s/1970s regulation period was new: the "externalities" of the multiple uses of water - economic, industrial and political - were building up in the 1960s. Some type of threshold was occurring, the public was asserting that new, comprehensive planning was required. What types of water quality institutions were available to the new environmental movement?

Water Quality Institutions

The dictionary defines institution as an organization established for or devoted to promoting a particular object, that is, a formal arrangement. In this conventional sense, institutions are the range of laws, administrative rulings, organizations and their relations, customs and traditions which determine how society deals with its affairs. To say that something is an institution means, however, that we must account for behavioral factors. Institutions are a process by which values are having continuity over time. It is at the interface of the physical, biological and social institutions that water quality management institutions occur.

However, as mentioned, these water quality institutions are not always coherent. As a consequence of the complexity involved, comprehensive planning often occurs in incremental stages. That is, larger river basin and watershed problems are met with incremental changes rather than comprehensive changes. Some of the incremental changes are good water quality management but other incremental changes are detrimental (Dersch, 1990). In the atmosphere of conflicting institutions and complex political jurisdictions, incrementalism has tended to overwhelm comprehensive planning. This is a particular problem with non-point source pollution. However, point-source water quality management, as a planning area, has been effective. The federal grants program for municipal wastewater treatment, for example, has involved massive public planning, and has been a success. In order to place an effective comprehensive planning agenda into such a complex public sphere - in order for effective water quality institutions to be established in the face of incrementalism and

incoherence - something rather dramatic has to happen. This is the legacy of the environmental movement. The influence of the environmental movement has, however, been filtered through many water quality organizations. How have the water quality organizations emerged? How have water quality agendas become institutions?

Water Quality Organizations

There are myriad organizations that attend to water and related land resources at the national, regional, state and local levels. At the national level federal water-related agencies exist in areas which include: land-management, construction and operation, regulation and enforcement, research and inventory, and coordination and study. These organizations are: (land management) Bureau of Indian Affairs, Forest Service, National Park Service, Fish and Wildlife Service, Bureau of Land Management; (construction and operation) Corps of Engineers, Bureau of Reclamation, Soil Conservation Service; (regulation and enforcement) Federal Power Commission, Flood Insurance Administration, Environmental Protection Agency; (research and inventory) National Weather Service, Geological Survey, Agricultural Research Service, Office of Water Research and Technology, National Oceanic and Atmospheric Administration; and (coordination and study) Water Resources Council, National Water Commission, Council on Environmental Quality. (The first two of these last three are no longer in existence and the last organization is operating at 20% of its original funding) (Dersch, 1990).

Other national organizations include professional societies such as the American Water Works Association, the National Water Resources Association, Association of Metropolitan Water Agencies, and the Water Pollution Control Federation. Other professional organizations that have a broad interest in water resources and specific, active working groups that focus on water include: American Fisheries Society, the American Geophysical Union, the American Society of Civil Engineers, the American

Society of Range Management, the Society of American Foresters, the Soil Conservation Society of America, and the Soil Science Society of America. Two associations open to a wider membership representing both "hard" and "soft" sciences, law, and politics include: American Water Resources Association, and the International Water Resources Association. Of course, preservationist and action-study groups and associations play their part:

During the Echo Park controversy in the 1950s and the growth of the environmental movement in the 1960s, many relatively localized preservationist groups attained national status and membership. Many are involved with concerns other than water, but are active on the water scene. Many of their other interests, including concerns over pesticide and herbicide use, wilderness preservation and recreation activities, relate to water. These groups include the Audobon Society, the Conservation Foundation, Ducks Unlimited, the National Parks Association, the National Wildlife Federation, the Sierra Club, the Nature Conservancy, and the Wilderness Society.

There are also two major action-study groups: the Environmental Defense Fund and the Natural Resources Defense Council. Both grew to meet a need for citizen and class action lawsuits in the environmental quality arena in the late 1960s and early 1970s. The League of Women Voters is a major source of education and information and has, for a long time, been an important, nonpartisan, and effective influence on the natural resource scene (Dersch, 1990).

Regional organizations include a dozen regional river basin commissions (including the Great Lakes Basin Commission), and Section 208 planning agencies. Section 208 of the 1972 Water Pollution Control Amendments requires that

the Governor of each State, within sixty days, . . . shall identify each area within the state which . . . has substantial water quality control programs. Not later than one hundred and twenty days following, . . . the Governor shall designate (A) the boundaries of each such area, and (B) a single representative organization, including officials from local governments or their designees, capable of developing effective areawide waste treatment management plans for such area.

Not later than one year after the date of designation of any organization . . . such organization shall have in operation a continuing areawide waste treatment planning process.

(Such planning processes are to include)

1. identification of treatment works "necessary to meet the anticipated municipal and industrial waste treatment needs of the area over a twenty-year period";
2. establishment of construction priorities and a regulatory program; and

3. identification of agencies "necessary to construct, operate, and maintain all facilities required by the plan" and of the measures "necessary to carry out the plan", as well as a schedule of compliance. (Dersch, 1990, 129) (1972 Water Pollution Control Amendments, Section 208).

Highlighted in 208 is the requirement to identify processes, procedures, and methods to control nonpoint sources of pollution from agriculture, silviculture, mining, construction, salt water intrusion, residual waste, and systems for land disposal of wastes. The ramifications of 208 are extensive. Distinguishing "end of the pipe" point sources (covered under the National Pollutant Discharge Elimination System, or NPDES), from nonpoint sources, "the Section 208 process is the principal section applying land use planning to the problems of pollution control" (Dersch, 1990, 128). After some delays, EPA began issuing guidelines in 1975 and agreements were executed with the states. At the local level, 208 areawide agencies are quite diverse, with counties, conservation districts, multicounty combinations, and states as a whole being designated as local "208 planning agencies." The EPA itself was forming during this period.

The Environmental Protection Agency

Established by the Reorganization Plan 3 of 1970, the Environmental Protection Agency (EPA) assumed the duties of many existing agencies and assimilated some of their personnel. One of its roles has been to maintain (and restore) overall water quality throughout the nation. The EPA is responsible for administration of the 1972 Water Pollution Control Amendments, or PL 92-500, now known as the "Clean Water Act" by the amendments of 1977. The EPA is a widely diversified agency, with major efforts in research, coordination, construction (via grants to municipalities for waste treatment plants), and enforcement power.

The EPA has considerable influence over the management of lands everywhere by virtue of the Section 208 "Areawide Waste Treatment Programs" of PL 92-500, as mentioned. The EPA maintains ten regional offices as well as major research facilities at fifteen national

laboratories that conduct research into various biological, chemical, and social aspects of pollution and pollution control. Among the various water related agencies briefly described, the EPA has 90% of the budgeted money for water quality programs. (However, small amounts are budgeted for water quality activity to the Department of Agriculture, the Department of Housing and Urban Development, the Corps of Engineers, and the Department of Transportation (Dersch, 1990, 114).

Regulatory occupations span the boundaries of different organizations. In complex organizational sectors such as wastewater treatment the organizations themselves are nested in the interactive loops of a larger interorganizational network. Part of the story of how occupations emerge in such newly formed, or altered, organizational fields as clean water management involves the historical, cultural and network dimensions of how that organizational field itself becomes institutionalized. What were the institutional processes in the shifts of U.S. water policy from early development and coordination phases to the recent regulation phase of water quality activity?

Institutional Processes

Our subject is the emergence of a position in a massive civil works federal water initiative: the wastewater treatment grants program and other surface water positions. In order to understand the historical, cultural and network contexts of such federal water policy, we have argued that this recent policy and the 1960s/1970s environmental movement must be put in perspective. We need, in short to examine the history of earlier policy and conflicts in the institutional processes of federal water policy. This is a very large topic involving the way in which many institutional processes shape behavior in water management. How can we approach such a large topic in the brief space available? The processes shaping behavior in clean water management include, among others: legal processes, economic processes, administrative processes, persuasive processes, administration reorganization processes, planning processes,

and general social program processes. If we were to focus on key institutions, however, we could review this large history succinctly, and prominent in this developing institutional history would be the role of commissions, committees and councils.

The Role of Commissions, Committees and Councils: A Brief History of U.S. Federal Water Policy

Viewed over the last two centuries, the three main thrusts to federal water policy - development, coordination, and regulation - have each been influenced and guided by the establishing of commissions, committees and councils. Our major effort in this section, by placing U.S. water policy in its historical context, is to see how the changes in policy over the last two centuries created new institutionalist forms and how the recent rise of the environmental movement shifted water policy toward a new content - environmental regulation.

Development. In the 19th century the federal government facilitated settlement and development. This led to projects relating to navigation, canals, flood control, irrigation and hydroelectric power. Early efforts included Treasury Secretary Albert Gallatin's Report of 1808 which recommended a nationwide system of canals. Senator William Windom's Select Committee on Transportation made a report on Routes to the Seaboard (1874). Chief Justice John Marshall's majority opinion for the Supreme Court stated that the federal power to regulate interstate commerce carries with it similar federal authority over navigation (Foster and Rogers, 1988, 15). However, in the first half of the 19th century, use of federal powers was limited.

After the Civil War the Progressives rose to power bringing new values and ideologies and a greater use of federal powers. There are many political influences on water policy. For example, at that time Southern and Western water interests formed as coalitions for regional development through federal project support. Also the role for the federal government expanded in flood control. The Mississippi River floods of the 1870's

reinforced such needs, and Congress was persuaded to establish a Mississippi River Commission in 1879 to develop a comprehensive flood control program. Similar problems in the Sacramento and San Joaquin drainages in the west led to the creation of the California Debris Commission in 1893 (Foster and Rogers, 1988, 15).

In the western states a federal role in irrigation was a direct outgrowth of the settlement policies, (e.g., The Homestead Act, 1862; the Desert Land Act, 1877; and the Carey Act, 1894) offered land grants. But the important difference between the eastern and western land grants was the availability of water. Survey reports on the arid lands of the west (The Powell report, 1879) heralded what was to become a new era of federal involvement in irrigation. Under the Reclamation Act (1902), for the first time, Congress provided for a substantial delegation of program authority to an executive branch agency, the Reclamation Service, to accomplish the provisions of the act (Foster and Rogers, 1988, 16). This early precursor of the passing of federal law followed by delegating to the states examples the institutionalist forms of bureaucratic program slots (labor market positions) which become part of later programs.

Federal initiative also moved into hydroelectric power because facilities for navigation, flood control, and irrigation often required facilities for the storage of water which created opportunities for the generation of power (reclamation law in 1906).

In 1920 the Federal Power Commission conducted investigations of water resources generally,

. . . It's basin-wide surveys, first undertaken jointly but, later, solely by the Corps of Engineers, became the classic series of reports authorized in House Document 308 (1925). They were the forerunners of what would become a concerted federal commitment to basin-wide, water resources planning (Foster and Rogers, 1988, 16-17).

However, the relevance of this early history is to show that even with the first commitments to basin-wide water planning, the emphasis was on resource development, not environmental management.

The New Deal era of the 1930's saw federal involvement in water resource development reach new heights. The widespread depression conditions and the public reaction triggered an unprecedented use of federal powers, much of it related to water resources in an effort to stimulate the construction industries and to provide jobs.

The Tennessee Valley Authority (1933) was one such example . . . Other prominent New Deal initiatives included the Public Works Administration (1933) and the Works Progress Administration (1935), agencies that provided loans and grants, and a reservoir of workers, for state and local construction projects. During the depression era, business boomed for the federal water development agencies (Foster and Rogers, 1988, 17).

Many major reservoir projects were authorized under the River and Harbor Act (1935), for example the Bonneville, Grand Coulee, Central Valley, Fort Peck, and Parker Dams. Multi-purpose projects in the west were authorized under Interior's Reclamation Project Act (1939). Water storage and utilization projects in arid and semi-arid regions were authorized under Agriculture's Water Facilities Act (1937). Under Title II of the National Industrial Recovery Act (1933) national planning came of age under an argument that natural resource-based planning was an essential part of economic planning. However, again, even though these events ushered in massive federal programs, the emphasis was on economic recovery, flood control, and jobs, not directly on environmental management or ecological issues. However, as an institutionalist form of federal-state cooperation in a large planning mode, this 1930s history of the National Planning Board is relevant to our story.

By 1939, the (National Planning) Board had become the formal planning arm of a new Executive Office of the President. In addition to its role in reviewing and facilitating federal water development efforts, the Board began to stimulate planning activities at state and regional levels and to engage in cooperative planning with states for water resources with the help of Public Works Administration and Works Project Administration personnel. For the first time, the states were invited into the federal planning process.

Two main themes emerged from these Board-sponsored inquiries. The first was a growing commitment to the concept of integrated river basin planning, . . . The other theme was the need for a system of economic analysis to be applied uniformly to all federal water resources projects . . . (Foster and Rogers, 1988, 18-19).

Coordination. By the time of WWII, the problem of coordination among federal water resources agencies had become an issue. Competition between bureaucracies, multipurpose project conflicts among agencies, overlapping and even conflicting authorizations, and a fragmented system of legislative jurisdiction all were contributing to a growing need for coordination. The Federal Inter-agency River Basin Committee (FIARBC), was created when the National Resources Planning Board was abolished in 1943. Agriculture, Interior, and War, Federal Power Commission, Labor, and the Federal Security Agency (the first federal water pollution control agency) were members.

. . . (The FIARBC) could begin to create a working network of regional, inter-agency committees for specific river basins, thereby extending the principle of coordination to the field level . . . (and) these interagency committees began to follow the practice of including state agency representatives as participating advisors (Foster and Rogers, 1988, 20-21).

In the aftermath of a concerted war effort other consolidating measures were aimed at reducing a fragmented and bloated federal bureaucracy. Special attention was given to overlapping and uncoordinated water agencies. Hoover Commission reports (1949, 1954) recommended consolidating agencies and flood control programs; strengthening the process of project evaluation; and called for federal action to set up interagency river basin commissions.

There then began a remarkable series of water resources inquiries, not just to determine the direction of federal policy, but also to gather the political support necessary to bring about the required reforms. The Cooke Commission (1950) assembled a professional and administrative staff, secured the services of a host of consultants, established twelve working committees on specific aspects of water policy, and began to solicit information and opinions from state governors and attorneys-general, federal agencies, universities and colleges, national, state, and private agencies and organizations (Foster and Rogers, 1988, 22-23).

Eisenhower established an inter-agency, cabinet-level, Presidential Advisory Committee on Water Resources Policy in 1955 to consider the

recommendations of both the Cooke Commission and the Hoover Commission during a concern for water as a scarce resource prompted by the unprecedented increases in industrial water usage during the early 1950's. In a later section we will focus more directly on the specified changes occurring to the field of wastewater treatment during this mid-1950s period (see research question #7).

By the late 1950s Congress began to pay more attention to federal water policy within the House Public Works Committee. The Senate established a Senate Select Committee on National Water Resources chaired by Senator Robert Kerr (Oklahoma), which assembled and presented its report to the Senate on January 30, 1961 (Foster and Rogers, 1988, 24-25). The Kerr Committee offered specific recommendations: the need for comprehensive development and management of major water resource regions; the need to stimulate the states to take a more active role; coordinated, scientific research programs undertaken by the federal government; regular assessments of major water resources regions; greater efficiency in water use; and the importance of increasing public awareness of the nation's water resources. The new President, John F. Kennedy, recommended legislation that would implement the Committee's proposals.

For example, the committee findings relative to coordination and assessment, river basin commissions, and the stimulation of state programs emerged as titles of what was to become the Water Resources Planning Act of 1965. The Kerr Committee's research recommendations were incorporated into separate legislation, a measure that became the Water Resources Research Act of 1964 (Foster and Rogers, 1988, 27).

These various commissions, committees, councils and reports over 150 years of U.S. water policy helped establish many new institutionalist forms: federal programs, federal-state cooperation, interagency coordination, federal delegation of program roles (labor market positions) to the states. Some of the institutionalist forms were in place by the dawn of the environmental movement. But these old forms were also to be influenced by the new regulatory era content.

From Coordination to Regulation. As described, the phases of development were followed by a phase of coordination. This earlier transition had been based on internal developments in the complexity of water management institutions, public pressures for more effectiveness and efficiency, and a growing concern over water as a scarce resource given the increased pace of growth and development after WWII. The more recent shift in the 1960s/1970s from development and coordination to regulation, however, occurred in the context of a new type of environmental awareness: environmental practices that led to pollution and an increasing appreciation of the costs of unregulated growth.

. . . old (conservationist) and new issues (1950s preservationist and wilderness movements) began to coalesce in the 1960s and gradually evolved into environmental concerns. Epitomized by Rachel Carson's (1962) analysis of the subtle and wide-ranging impacts of pesticides on the natural environment and human beings in Silent Spring, these newer concerns were much broader than those of conservation. Environmental problems tended to (a) be more complex in origin, often stemming from new technologies; (b) have delayed, complex, and difficult-to-detect effects; and (c) have consequences for human health and well-being as well as for the natural environment (Mitchell, 1989). Encompassing both pollution and loss of recreational and aesthetic resources, such problems were increasingly viewed as threats to our quality of life (Hays, 1987). (Dunlap and Mertig, 1992, 2)

Dunlap and Mertig, in their 1992 essay on the history of the environmental movement, provide for us a detailed list of reasons accounting for this transition. In order to understand the premise that the environmental movement influenced the new environmental positions, we would like to add their account to the earlier account given by Schnaiberg (1980) by quoting them at some length:

Thus, by the late 1960s the third wave of conservationism had evolved into modern environmentalism . . . What accounted for this transformation?

Analyses of the emergence of environmentalism (e.g., Hays, 1987) have emphasized one or more of the following:

- (1) The 1960s had given rise to an activist culture that encouraged people, especially youths, to take direct action to solve society's ills.
- (2) Scientific knowledge about environmental problems such as smog began to grow, as did media coverage of such problems and major accidents such as the 1969 Santa Barbara oil spill.
- (3) A rapid increase in outdoor recreation brought many people into direct contact with environmental degradation and heightened their commitment to preservation.

- (4) Perhaps most fundamentally, tremendous post-World War II economic growth created widespread affluence, eventually lowering concern with materialism and generating concern over the quality of life.
- (5) Many of the existing conservationist organizations broadened their focus to encompass a wide range of environmental issues and attracted substantial support from foundations, enabling them to mobilize increased support for environmental causes. In the process, they transformed themselves into environmental organizations (Mitchell, 1989).

Although its origins are undoubtedly complex, the environmental movement had clearly "arrived" by 1970, as shown by the tremendous growth in the size of the conservation-era organizations, the development of newer organizations, and in widespread public support (Dunlap and Mertig, 1992, 2-3).

An era of activism, increasing knowledge, an ethic of outdoor recreation, the impact of tremendous post WWII growth, and the broadening concerns of conservation groups ushered in the new environmental movement. Unlike the development and coordination phases, the new social movement atmosphere stimulated missionary orientations in the new (or altered) labor market positions. With the emergence of the environmental movement the push was on for the creation of new federal agencies, sometimes using old institutionalist forms. The Environmental Protection Agency was established. Legislation was pushed for and passed, aimed at combating air and water pollution and requiring environmental impact statements.

Summary: Orchestrating the Emergence of an Organizational Field

As we have seen, commissions, committees and councils worked for twenty years (1945 to 1965) to establish comprehensive planning without final success. With their conception of water issues framed in "water resources", or development and/or coordination perspectives, their base for political action was limited. When, however, the issues of water by the 1960s became "environmental", now the widespread concerns of an activist public regarding health, recreation, aesthetics, and the ecological implications of unregulated economic growth created a vastly enlarged political base. The Water Resources Council (1965) and the National Water Commission (1968-1973) began to articulate this change in water management perspectives. Now the myriad organizations (federal

agencies, national associations, regional, state and local) were brought into the new "social problem" process. Local preservationist-conservation groups rose to become national in their lobbying efforts in concert with a U.S. population "aroused as never before" in reaction to a series of 1960s and early 1970s environmental catastrophes. This process generated a massive popular sentiment and an effective environmental social movement orchestrating the emergence of the third phase of U.S. water policy: a regulatory era.

This new era formed a new organization, the EPA, with primary responsibility for regulation surrounding water quality, new mandated relationships, and new work (environmental water quality specialist activity) for old roles (chemist, engineers, biologist, planner) and new work for new roles (environmentalist regulatory roles).

Conventional literature on emergence of organizational fields tends to take a governmental policy shift and show how it influences, as an institutional phenomenon, organizations (Dobbins, 1992). However, the case of a popular social movement influencing a shift in government policy suggests the importance of focusing on the tense struggle to orchestrate the emergence of that shift in policy, and in subsequent years to keep influencing, or orchestrating, the nature of the emerging organizational field institutionalized by the new laws.

Subsequent History of Federal Water Policy as the New Organizational Field Emerges: 1968-1986

The new, emerging, environmental consciousness had begun to influence federal water policy as reflected in a shift in the way committees, commissions and councils set their agendas and in the choice of emphases in their reports. For example, in the middle 1960s a major assessment of federal water policy was spurred by controversy over water in the Colorado River basin and a National Water Commission was created by Congress in 1968. The National Water Commission's final report went to the President and Congress in June of 1973 and contained over two hundred

recommendations. Its major departure from earlier commissions, committees and councils was its declaration that meeting the water demands of growth was not an inevitable policy position - society could and should control growth itself. Other important recommendations included: a marked shift of priorities away from water development toward the preservation and enhancement of water quality; the need to tie water resources planning more closely to land planning; an emphasis on greater use of economic approaches to reduce water loss, increase efficiency, and advance conservation; utilization of the beneficiary-pay principle in water projects; the need to re-examine laws and legal institutions governing water resources; and an emphasis that the primary actors should be at the level of government nearest to the problem with the capacities to represent all interests and resolve the matter in a timely fashion (Fosters and Rogers, 1988, 27).

However, the new regulatory phase initiated with NEPA (1969) and the Clean Water Act (1972) had been voted in with such strong pressure for change that the new stringent laws of this new environmental, or regulatory phase, itself required the work of commissions and councils to sort out. For example, the National Commission on Water Quality began working in the summer of 1973 in response to the pressures of the new laws. Unlike other inquiries, the Commission had a specific job to do. Its assignment was to consider the midcourse corrections necessary to the stringent requirements of the 1972 Federal Water Pollution Control Act, measures that had mandated fishable-swimmable waters nationally by 1977, and zero discharges of pollutants into navigable waters by 1985. The cleanup effort had proven more complex than was originally envisioned. There were, however, potent political forces opposed to any relaxation of standards (Foster and Rogers, 1988, 28-29).

The Commission made several recommendations: there should be extensions and waivers on the 1977 ("best practicable" technology) and 1983 ("best available" technology) deadlines on a case by case basis, and

a blanket five to ten year extension on the 1985 zero discharge deadline, with a similar commission established in 1985 to weigh progress. Generic warnings were given about non-point sources and toxics. However, the most important link between this commission and the new federal grants water quality positions was its recommendation for a delegation of responsibilities to the states for these key roles and to establish five to ten year level funding for the program. The Commission found that the EPA was overtaxed:

. . . The required tasks of issuing rules, regulations, permits, effluent guidelines and limitations were simply monumental. Shortfalls in funding for the large construction grant program, and slow progress in obligating even the funds available, had led to significant delays in achieving the 1977 requirements. Little or no effective planning had been accomplished either. Much of the administrative morass could be relieved if administration and regulatory functions were turned over to the states, the Commission observed. But construction grant funding remained the most critical element of the program. Not only should the 75% federal cost share be retained, the Commission Reported, but the program should be level-funded for five to ten years at a rate of \$5-10 billion per year to stabilize the planning of municipal treatment facilities, the key feature of the entire national water pollution control effort (Foster and Rogers, 1988, 29-30).

Federal water policy is a complicated topic to which we cannot do justice in the space we have available. However even though there were many changes in the Carter and Reagan years, it should be noted that as far construction grants for municipal treatment facilities, the program did remain level-funded for the "origins effect" period in question (1977-1986) and the planning efforts were stabilized effectively. What this meant was that by 1977 the grants policy had begun to stabilize, the responsibilities were delegated, and the initial position work roles were then filled by the new incumbents who are the subject of our study. These initial incumbents in the new, initial positions, were soon, however, to witness a significant counter-movement.

The Reagan Years Counter-Movement

By 1981, just five years later, the "origins effect" of the twelve year old environmental movement, while institutionalizing new environmental jobs (e.g., in the WWT grants program), had begun to be

challenged by the Reagan administration. Reagan terminated the Water Resources Council, threatened to sweep out seven river basin commissions, and eliminate the state grants program consolidating these responsibilities, instead, under a cabinet-level council and a new office in the Department of Interior. Could the institutionalization of the social movement be deinstitutionalized? Our theoretical review emphasizes the importance of counter-movements. What are the events of this period and how did they affect occupational emergence? Dunlap and Mertig described the tension this way:

. . . the election of Ronald Reagan reversed (the trend toward a fading away of initial enthusiasm) by stimulating a resurgence of environmental concern and activism. The anti-environmental orientation of his administration, highlighted by Department of Interior Secretary James Watt and Environmental Protection Agency Director Ann Gorsuch, provided environmental organizations with reason - and ammunition - for mobilizing opposition to his policies . . .

In the process, the environmental movement not only avoided a demise but it experienced a major revitalization, gaining increased membership, new organizations (especially at the local levels), and renewed support from the public and policymakers. This suggests that efforts by government to overtly repress or "de-institutionalize" a well-entrenched movement (as opposed to using more subtle "capture and co-optation" techniques) may backfire. By threatening environmentalists hard-won "interest group" status, the Reagan administration rekindled the movement's zeal and activism (Dunlap and Mertig, 1992, 4-5).

While opposition to the Reagan agenda helped the revitalization of environmentalism in the 1980s this phenomenon was also stimulated by several additional, underlying phenomena: the widespread appeal of environmental protection due to the visible and threatening nature of the problems; the fact that progress was quickly offset by the emergence of new problems, often on a wider and even more ominous scale (acid rain, ozone depletion); increasing awareness and recognition of such events resulting from the institutionalization of "environmental science" in government, academia, and in environmental organizations - all of which was increasingly stimulated by media attention; and, the fact that environmental awareness had become institutionalized within many government agencies, scholarly associations, educational institutions and

in churches - ecological consciousness had become part of the American value system (Dunlap & Mertig, 1992, 5).

The environmental movement, then, influenced the emergence of the position in two ways: 1) the new regulatory phase of U.S. water policy, initiated in an era of an activist, knowledgeable, outdoor public concerned about growth, backed up by congressional and Presidential councils, commissions and committees, and increasingly represented in lobbying and litigation by professionalizing social movement organizations (SMO's) instituted new legislation enacting clean water management positions, and 2) this new environmental movement had direct influences on these new state-level positions in terms of increasing the complexity of the organizational field, expanding the knowledge base required, and contributing to rapid change, including resistance to, and a sense of revitalization against, rapidly emerging counter-movements.

Research Question #2: How did the environmental movement influence characteristics of initial incumbents? (movement effect, cohort effect, origins effect)

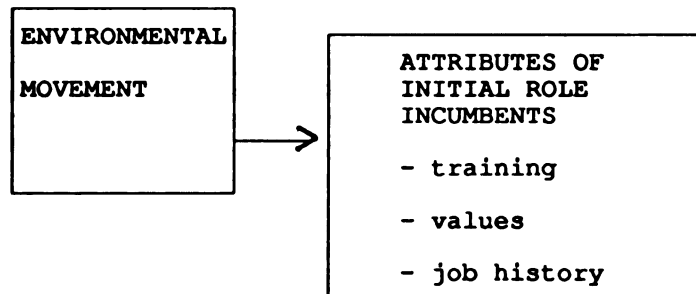
Our expected causal model leads us to hypothesize that the environmental movement had an influence on the attributes of the initial role incumbents. This influence would have affected initial role incumbents training, their values and their job history. This is represented in our causal model by the line of influence suggested in Figure 5, below.

Discussion

It is to Karl Mannheim (1936) that we owe much of our insights on the problem of generations. He noted that, as the tempo of change in society accelerates, a single generation (through horizontal and vertical mobility) may come to see that ways of thinking can differ, and that change may require of a generation theoretical reflection. He noted that

Groups of pre-capitalist origin, in which the communal element prevails, may be held together by traditions or by common sentiments alone. In such a group, theoretical reflection is of entirely secondary importance.

Figure 5. Environmental Movement Influences on Attributes of Initial Role Incumbents.



On the other hand, in groups which are not welded together primarily by such organic bonds of community life, but which merely occupy similar positions in the social-economic system, rigorous theorizing is a prerequisite of cohesion (Mannheim, 1936, 131)

We have emphasized that the nature of the environmental social movement and its partial institutionalization influenced the initial positions in terms of complexity, knowledge and rapid change. From the point of view of the initial incumbents, the environmental movement itself provided a socio-cultural and historical context for a certain "thought-model." The question was: can the human environment survive? The answer, in part, was provided by the programs the environmental movement institutionalized. Mannheim observes that, in general

Behind every definite question and answer is implicitly or explicitly to be found a model of how fruitful thinking can be carried on. If one were to trace in detail, in each individual case, the origin and the radius of diffusion of a certain thought-model, one would discover the peculiar affinity it has to the social position of given groups and their manner of interpreting the world. By these groups we mean not merely classes, as a dogmatic type of Marxism would have it, but also generations, status groups, sects, occupational groups, schools, etc. (ibid, 276)

As a first cohort environmentalist generation, as a middle-mass stratum, and as an occupational group, the initial incumbents of clean

water management positions could be expected to have been influenced by the knowledge and worldview represented by the context (and historical action) of the environmental movement. Mannheim noted that

. . . what, from the point of view of immanent intellectual history, appears to be the "inner dialectic" in the development of ideas, becomes, from the standpoint of the sociology of knowledge, the rhythmic movement in the history of ideas as affected by competition and the succession of generations (ibid, 270).

We noted earlier in this chapter, in our general history (Part III), the continuing fervor existing in the career guidance literature describing environmental management jobs in the middle seventies and early 1980s, the period when our initial incumbents were entering the initial positions. This career literature contained a recurrent "save the world" consciousness - a type of movement consciousness. What is the source of this fervor?

Our interviews with key informants who filled the initial positions emphasized that early incumbents in the WWT position were influenced by a commitment to comprehensive planning. We have noted in our review of federal water policy that despite repeated commission and committee reports recommending it, the political constituency for any comprehensive planning, beyond development and coordination, was not there until the advent of the broad-based environmentalist movement of the 1960s and early 1970s. The earlier pre-environmental movement role of public sanitarian and the municipal organizations associated with this longstanding work jurisdiction come out of the public works history, but the recent decades of environmental movement have job-enlarged and job-enriched the sanitarian role away from its civil engineering roots toward a broader ethical, ecological, professional, and planning orientation - toward environmental management.

The public works tradition includes a concept of planning, but our key informants, when reflecting on the evolution of their own positions, emphasized not the civil engineering tradition (of municipal facilities planning), but rather the way in which public works jurisdictions get

transformed: through urban phenomena such as public outcrys, through social movements, and through environmental crises (plagues, disease). The impact of systems thinking in the 1960s included active theoretical work in human ecology (Schnore & Duncan, 1961; Hawley, 1968; McHaig, 1969). It seems that in the informants' perspective the rise and importance of comprehensive environmental planning is the major social movement goal that has influenced their training and their values, and that has influenced the nature of the position, and their job history. That is, the new environmental position mission is backed up by a theoretical worldview - comprehensive environmental planning.

The environmental movement, then, influenced both the old positions (making new roles) and created new roles for new positions - endowing both with an expanded mantle of comprehensive planning. That was the call of the day: to plan things better. Rivers were burning, lakes were dying. Things had to be done better.

The key informants report, however, that they were concerned to stay environmental instead of being overwhelmed by bureaucracy. Their training and values sensitized them to the dangers of not getting backup for comprehensive planning. Wilensky (1964) has suggested that the "new, mixed-forms of professionals" would take social movement goals as their own. We can take these reports by early incumbents in our intensive interviews as suggesting that comprehensive environmental planning is a major movement goal that may have become an individual goal for many of the initial incumbents.

This conclusion was borne out by eight months of participant observation with the work unit in 1981. At that time the author, observing the municipal facilities planning unit daily, as office manager/unit executive secretary, saw a definite "bias" toward planning as a major goal, and a frustration with impediments to the sensibilities of environmental planning. It was a time of the Reagan counter-movement and the environmental movement was becoming revitalized, as described. A

subsequent four month organizational development project with the work unit in 1987 again confirmed the "bias" toward planning: the composite organizational development data from 22 interviews (interviews with all grants unit members) indicated, in a "bottom up performance appraisal", a desire for project managers to be "in" on more of the decision making done by senior departmental management that involved carrying out the logic of project management and environmental planning. Secondary sources indicate similar missionary goals focused on planning. Career literature, popular books, newly emerging university environmental program texts - all emphasize the missionary goal of planning. But to what extent is this orientation toward planning (a) a characteristic of the type of person who goes into various types of outdoor, "environmental" or civil engineering work regardless of historical period, or (b) a characteristic of a sociological category such as an historically specific generational cohort?

Individual Characteristics Leading to Self-Selection of WWT Jobs and/or a Distinct Cohort Effect

Earlier academic research on recruitment into outdoor, "environmental", or civil engineering work has tended to emphasize the agency environment and individual characteristics of recruits to explain career identity. In the classic study by Herbert Kaufman, The Forest Ranger (1960), a study of a federal resource management program (U.S. Forest Service) and its administrative behavior, Kaufman raised the question: how to devise and operate an agency that on the one hand was characterized by consistency with organization-wide norms while on the other hand preserving individuality and stimulation of creativity and action on the part of the forest rangers in the field. His research focused on the way in which both training and ongoing coordinating policies in the U.S. Forest Service inculcated in the new forest rangers the attitude that they were in charge of their districts. It was an inculcated norm that individuality, creativity and action would occur with

the local district ranger and not with the thin federal level bureaucracy. Also, Kaufman noted that this may have been an administrative policy that was necessary given the vast number of local districts and the complexity of each district's problems and decision-making - a decentralized structure was needed (Kaufman, 1960, 185-200).

In some ways this description is similar to the problems the newly formed EPA had between 1972 and 1977 in building the wastewater treatment grants program. The EPA began structuring itself with a series of delegations of the WWT program to the states where local "project managers" and municipal facilities section employees were recruited to make many of the myriad decisions and monitor the program. However, the earlier work by Kaufman emphasized that, in building identification with the Forest Service, the new recruit experienced agency training, procedures and policies that built up identification with the Forest Service and also that these recruits were predisposed to seek outdoor, "environmental" or forestry work.

There are two ways in which this previous work does not match the questions raised in studying recent environmental management types of work. First, the forest ranger had been an occupation for many, many decades. Kaufman was not describing the emergence of a new occupation. The Forest Service had developed its policies over many decades and recruits were aware of the forest ranger occupation as a long standing type of work. Second, there is little indication that in the period of the 1950s when Kaufman did his work there were significant social movements influencing the young adults of the day regarding forestry work. In contrast, over the last twenty years of recent environmental work both of these conditions existed - the emergence of many new types of work, and a strong social movement influence. Therefore we must examine the hypothesis that influences on the characteristics of initial incumbents of wastewater treatment grants program and surface water types of work may have included not only agency milieu and self-selection (dimensions studied by Kaufman),

but also movement effects, cohort effects, and, in general, historical, cultural and network origins effects - all of which were not present in the earlier 1950s studies.

Schnaiberg (1980), describes the transition in the environmental movement from the early 1970s "mobilization to power" to the period of "resistance to opposition" (late 1970s, early 1980s). The early incumbents were entering the initial positions during this transition: the new legislation was being ironed out, delegations were being made to the states, the practicalities of level-funded, long-term project planning were being worked out in the emerging organizational field. Just during this time significant waves of counter-movements from major industries affected by regulation, and the general critiques of regulation that ushered in the Reagan administration were occurring. The early years of the Reagan administration, as has been described, mounted significant counter-pressure to environmental regulation with the appointment of James Watt to Interior and Ann Gorsuch to EPA. This period of the environmental movement - a period of revitalization and resistance - influenced the characteristics of initial incumbents according to our data.

We have reported two main sources of data in our case study on how the environmental movement influenced the characteristics of the initial incumbents: intensive interviews with senior worker, long-term, initial incumbents, primarily in the municipal facilities section, and survey attitude data from the Michigan Surface Water Division.

Intensive Interview Results

The key informants were interviewed periodically, during the period 1987-1991, and reported uniformly that they were influenced during their undergraduate or graduate careers by the environmental movement. They reported remembering the impact of "Earth Day" (1970), the passage of laws, and especially the atmosphere in their classroom and among their fellow students on campus: they were part of something, read the popular books on ecology and the environment, and sought positions after their

graduation in which they could utilize their degrees in an environmental field. The environmental movement goal of comprehensive planning, especially, figured in their world views. On the one hand, it was necessary and important to beat back the impediments to a thorough-going, comprehensive approach to environmental planning. On the other hand, initial incumbents also indicated a well-developed, political sensibility about the realities of large, bureaucratic programs, local and regional politics, and the necessity to compromise their attitudes "in order to get anything done." Nevertheless, the insistent value that a comprehensive planning logic was needed to meet ecological goals pushed them to engage in efforts to influence policy to "be environmental". For instance, some of the key informants described "battles" they had had with "the system" over particular policies that diminished the "environmental" role: policies that lessened their role in environmental impact statements; policies that increased routine paperwork (thus removing them from work in the field or from environmental research); and policies and practices that reduced their direct impact as environmentalists on projects or decisions. These concerns also were revealed generally in the composite results of interviews with the entire unit during the organizational development project in 1987.

Survey Questionnaire Results

Two questions in the survey of Michigan Surface Water Division water quality workers give some evidence for environmental movement influence on the initial incumbents. These are: "What made you apply for this work?" and "What other kinds of changes do you perceive in the nature of your water quality related job(s) over recent years?" For the 49 respondents in the survey, we found 19 had given reasons for applying for the job directly or indirectly related to the goals of the environmental movement. This represents a total of 39% of all survey respondents indicating an environmental influence on why they applied for the job. Overall, other reasons for applying for the job included location, stable job, bumping in

from another job, needing a job, and vague reports of the job fitting their background. We then separated questionnaire results into two cohorts - a first cohort in the position more than six years (N = 29), and a second, more recent cohort in the positions five years or less (N = 20). Our findings for the survey question, "Why did you apply for this job?", sorting for the influence of the environmental movement on the first cohort, is that approximately the same percent, 38%, mention reasons for applying for the job directly or indirectly related to the environmental movement. This strong showing of influence of the environmental movement among older, first cohort incumbents is all the more striking since one would expect on other grounds that the other reasons for applying for the job (that may have been a recent transfer or promotion) would be even stronger, eg., pay, benefits, transfer, parents near, stable, or local job. That is, the responsibilities of older respondents might tend to result in many of these other reasons showing up more frequently. We can conclude that the environmental movement and its goals have had a strong, continuing, influence on between one-third and one-half of all initial incumbents. Other comments to this survey question included: "work outdoors" pay & benefits, needed a job, more professional work, transfer, challenging, compatible with educational background, looking for a change, "no particular reason", "this is what was available", local position, and stable position. Some of the respondents' specific reasons for applying for this work and job changes they have perceived that directly or indirectly relate to the environmental movement included:

Reasons for applying

- concerns about water pollution in general
- desire to work for regulatory agency on surface water issues
- interest in the field of environmental protection
- wanted to be involved in environmental protection
- it was what I went to school for. Always have loved aquatic systems
- interest in water pollution control

- my desire to work in the environmental field
- I want to do something to impact the resources of the state in a direct manner.

"Changes perceived" indicating movement influence

- I notice that more and more of the decisions are politically based rather than technically based
- More political control in environmental decision making process
- Away from specifics, i.e., end of the pipe to larger basin-wide effects, eg., nonpoint source, hydrological changes, sedimentation less toxics
- The job has become a technician's job which requires following procedures and little else
- Doing bureaucracy and PR is more important than doing good science. Its more important to feel good about water quality than to have any indepth understanding of it.
- Increased emphasis on cleanups of toxic chemicals. With Engler in office, shift in emphasis from protect environment to protect business.

In a more comprehensive study of these questions additional research could design interview formats of a larger sample of generational first cohort initial incumbents. However, these reasons for applying for the job and responses of changes perceived over time in water quality work give a direct or indirect measure of their consciousness of the environmental movement's influence on their type of work, and on themselves.

Research Question #3: Did the emergence of the position and characteristics of the initial incumbents affect the environmental movement? (interactive effect)

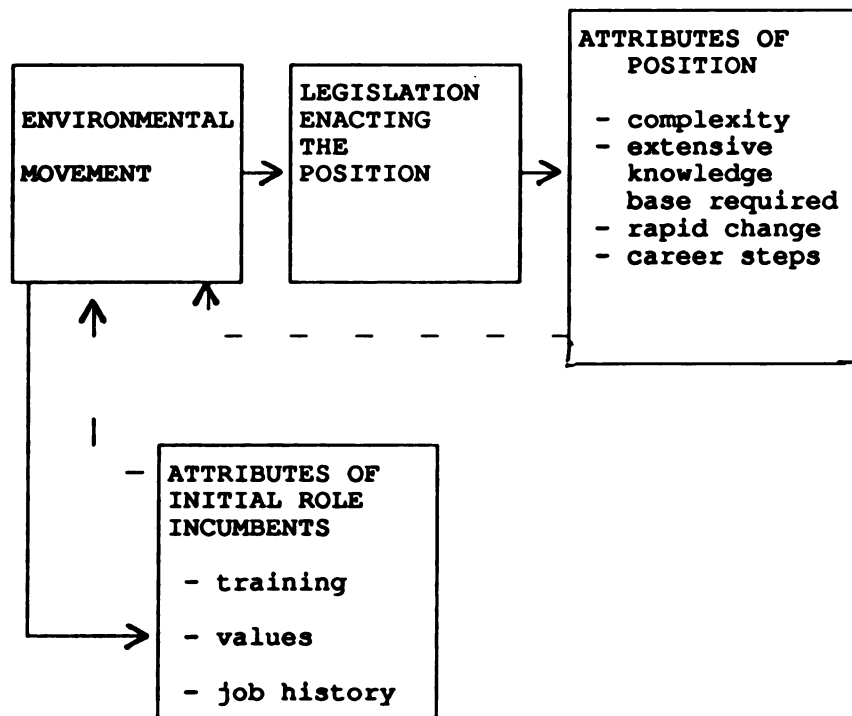
Discussion

In asking our third research question we specify the general causal model in another way, by adding interactive lines of influence between attributes of the position and attributes of the initial incumbents and the environmental movement, as indicated in the modification shown by the added dotted lines in Figure 6, below.

In discussing the impact of the social movement on the initial positions and the initial incumbents we have stressed the direct influence of a social challenge and social response view of social movements

(Gamson, 1975). That is, we have emphasized the phases of the environmental movement from mobilization to power, the response of anti-regulatory counter-movements, and the environmental movements subsequent resistance and revitalization. However, there are other processes at work in the context of social movement institutionalizations besides "the

Figure 6. Interactive effects of initial position and initial incumbents on the environmental movement.



power peddle" - influences that are more idiosyncratic, fortuitous, unintentional perhaps at times, and that are interactive. (This insight was provided by R. Scott in a personal communication, 5/1/92, Asilomar Conference on "Emerging Organizational Fields"). It is our hypothesis that there may be such interactive effects at work in our story. To understand how two or more factors may interact with or affect a third factor we need, in addition to challenge and response movement theory, some additional type of interactive, additive, multiplicative, or dialectical model that operates, often, as the institutional perspective emphasizes, in idiosyncratic ways (Perrow, 1986, 157-177), over time. Gareth Morgan offers Maruyama's interactive or feedback loop analysis for the growth of a city as one model of mutual causality in understanding organizations generally, and describes the model in this way:

The secret of (growth of a city) does not rest in any simple cause but in the deviation-amplifying process. Maruyama argues that this kind of process explains the evolution of both nature and society, processes of positive feedback producing changes that are quite out of proportion with the initial "kick" or incident that activates them. Initial kicks of high probability, eg., that water will collect in a crack, or that a farmer will settle on a plain, escalate to produce deviations that have a very low probability, e.g., that a particular tree will grow in a particular crack, or that a city will develop at a particular point on a homogeneous plain. Random mutations in nature and accidental events and connections in social life, given favorable circumstances, initiate open-ended processes of self-organization in which positive and negative feedback interact to produce changing patterns that may at some point assume relatively stable forms.

The relevance of this kind of analysis for understanding the events and processes that shape organizations and their contexts is obvious . . .

. . . [However] there are difficulties associated with contextual analysis . . . The best approach (to acquire "systemic wisdom") is often to (a) attempt to identify the principal subsystems or nests of loops that hang together, (b) modify their relations when necessary by reducing or increasing the strengths of existing linkages and adding or removing loops, and (c) give particular attention to the loops joining different subsystems . . .

The development and practice of this kind of systemic wisdom requires an organizational capacity for appreciation and learning, and for the process of self-organization . . . (Morgan, 1985, 248-254).

To example this for the occupational story of clean water managers we began with the social movement (cause) influencing the initial position (movement or institutionalization effect), and now we are asking what causal role the nature of the initial position and characteristics of the initial incumbents had on the environmental movement (interactive effect). In addition, we began by asking how the social movement influenced the initial incumbents (cohort effect), and now we are asking what causal role the characteristics of the initial incumbents had on the environmental movement (interactive effect). There are several positive amplifying loops, and some negative amplifying loops to be discussed. A brief review, in more depth, of some recent research on the emergence of an occupation may help give us a point of comparison for the case of environmental management.

Blum and associates (1988) noted, in their analysis of the emergence of an occupation, the phenomenal rise of employee assistance program roles in U.S. organizations in the 1970s and early 1980s. In their analysis of the emergence of the "occupational program consultant" role they noted:

Partly as an offshoot of the diffusion of Alcoholics Anonymous (AA) in the 1940s and 1950s, a number of companies established formal programs to identify and provide assistance to alcoholic employees. The ingredients apparently necessary for program formation included large organizational size, the presence of an employee who was an energetic and effective AA member, a medical director sympathetic with alcoholism and convinced of the value of the AA modality, and sometimes an external change agent from either the Yale Center on Alcohol Studies or the National Council on Alcoholism who would aid in writing a policy statement, training supervisors, and/or gaining cooperation of the union (Blum, et al., 1988, 99).

In this analogous example of the emergence of an occupation the presence of employees (and change agents) who were energetic and effective AA members (self-help social movement), and the presence of management people (medical directors) sympathetic with the (movement-like) alcoholism-as-a-disease perspective and the AA program modality, suggests the importance of social movement activity and goals in the very initial formation of the employee assistance programs. However, in addition to the initial formation, these elements - energetic individuals with social movement

goals, the transition from amateur to fulltime labor market position, the role of government grants and programs and sympathy for the social movement in organizations - are important for the character of the origins effect as the occupation emerges, and these elements also help focus on the way the emergence of the initial positions and the character of the initial incumbents influenced the movement in this analogous case.

For example, in the case of the "occupational program consultant" (OPCs), Blum and associates note that in 1970 a major social movement was initiated through Public Law 91-616 establishing the National Institute on Alcohol Abuse and Alcoholism (NIAAA). With a goal to "mainstream" alcoholism in the health care treatment system, the NIAA's efforts

. . . required the establishment of health insurance coverage for alcoholism, vast increases in alcoholism treatment capacities, and, most important, the identification and referral of greatly increased numbers of alcoholics for treatment.

In an aggressive fashion foreign to the historically small band of workers in the alcoholism field, the NIAAA undertook to fund a range of service delivery projects. Among them was a program of grants to the states for the funding of OPCs, originally defined as full-time employees of the state alcoholism authority who would contact and cultivate executive-level decision makers in work organizations (Blum, et al., 1988, 100).

The general, interactive effects in the case of the OPCs involved a distinct atmosphere of a social movement, energetic individuals moving from amateur to full-time status, a sense of collective mission provided by the first federal agency to deal with alcohol problems since the repeal of Prohibition in 1933, and the responses of organizational decision-makers. Specific interactive effects evolved from the very narrow base adopted for employee problem identification: signs of work performance that could be subject to written documentation.

The basic assumption was that a chronic alcohol problem would have a visible impact on job performance . . .

While seemingly commonplace, this technical innovation was significant in setting the stage for a new occupation. Indeed, implementing a program wherein alcohol problems were to be identified by signs other than those typically associated with heavy drinking required careful policy formulation and specifically designed supervisory training, these skills to be brought to the work organization by the OPC. . . This change also broadened the coverage of programs to include problems other than alcohol abuse that affected performance, leading to the expanded concept of "employee assistance programs" (Roman, 1981). Thus, via this

innovation, the OPC also was afforded the role of generating an expert counseling function within the organization.

The second innovation centers on the establishment of models of formalized inpatient and outpatient treatment for alcoholism and the construction of centers for such treatment. . . This innovation also allows for formal and even contractual relationships between treatment centers and work organizations. . . Of critical significance here is the fact that this technical innovation created a vital set of roles for the OPC, affording him or her the opportunity to function as the link between the work organization and treatment agencies and to maximize the efficiency of these relationships (Blum, et al., 1988, 101-102).

In the discussion by Blum and associates it is not clear how the emergence of the position might have influenced the "mainstreaming" of alcoholism as a disease. Certainly in terms of resource mobilization theory the newly fulltime OPC positions, first beginning as roles in a state alcoholism authority backed up by a program of grants, had an impact on the "mainstreaming-of-alcoholism" movement: now there was money and new positions. The Blum article traces how these initial state alcoholism authority and grants programs then evolved into private sector, "occupational program consultant" roles.

A somewhat similar history exists in the newly emerging environmental management roles. The mobilization stage of the environmental movement in the late 1960s and early 1970s, characterized by "Earth Day" and the passage of NEPA (1969) and the Clean Water Act (1972), brought forth energetic amateurs. Then the formation of the EPA, the federal grants program, and other permit system roles (between 1972 and 1977) created the initial fulltime positions - positions with a narrow definition of establishing permits to control water quality standards and a collective sense of mission in the new comprehensive planning grants program. The emergence of these positions in the period 1972-1977, in a resource mobilization or power phase of the environmental movement provided state authority positions and a level-funded grants program to influence community decision makers to adopt more comprehensive environmental planning in the water quality, municipal facilities area. However, just as these positions were becoming institutionalized, significant counter-movements against the regulation phase of the

environmental movement surfaced with the various anti-regulation campaigns of the late 1970s and the Reagan administration of the early 1980s. The Blum, et al., (1988) research does not deal with counter-movements in looking at interactive effects. How did the new positions and the characteristics of the initial incumbents affect the environmental movement during this period?

Intensive interviews with initial incumbents asking them to recall their initial experiences in these positions suggests that they were aware of the importance of the positions to the environmental movement. In their interviews they give anecdotes about "first confrontations" in their role with all the important players in the newly emerging, mandated organizational field - first encounters with municipal officials, plant superintendents, citizen groups, state politicians and EPA regional staff. The sense of being involved in a new program, establishing the character of the key, linking role, and carrying out the sense of collective mission in comprehensive environmental planning was acute. Our study is not designed to measure the interaction with the environmental movement at that time beyond the reports in these interviews. Clearly, however, the "program professional" hypothesis (Wilensky, 1964; and data from this study) suggests that such interactive loops will happen. Wilensky described the case of "labor staff experts" - a situation where the labor movement creates labor staff experts, and then once there are these newly emergent fulltime jobs, the labor staff experts attempt to keep the labor movement going along according to its social movement goals (eg., "keeping labor left"). Similar to the occupational program consultant who keeps the collective sense of mission to provide employee assistance, and to the labor staff expert who keeps the labor movement on course, the new position and the characteristics of the initial incumbents in the emergence of the water quality grants program reflects attempts to keep faith with the collective sense of mission - to realize environmental goals.

These interviews (occurring between 1987 and 1991) indicated that key informant, initial incumbents, who had been in these positions 12 to 15 years, were still interested in the environmental movement. This was exemplified by the way in which several of them worked, in the 1980s and early 1990s, outside the work role in voluntary organizations, local and even national politics. One key informant in the grants unit had worked as a resident in a local township, between 1983 and 1992, giving testimony on water quality dimensions of growth and development projects, as a consultant to a "no growth" set of newly elected local township council members, helping to draft local water quality ordinances, and working on comprehensive township environmental planning. Another key informant in the grants unit had been studying the national issues of the North American Free Trade agreement and was recruited by the EPA to be a member on a national hearings panel. The panel traveled around the country presenting analyses on environmental aspects of NAFTA during the period 1991-1992. A third key informant had worked on presenting reports to key administrators on ways to strengthen the environmental planning effectiveness of the MDNR, and alerting administrators to aspects of new federal and DNR policies that would possibly weaken "environmental" results.

These workplace, local, and national movement-oriented, continuing, efforts characterizing these informants in the Michigan water quality positions suggest that, just as Wilensky (1964) had predicted, for initial incumbents in these new, mixed-forms of professions, social movement goals would be adopted as personal goals and influence occupational identity and behavior. Moreover, these interview results give credence to the hypothesis that there have been "feedback loop" effects over time, beginning at the origins effect, in which attributes of the initial position and attributes of the initial incumbents interact with and influence the environmental movement. Similar intensive interview data in all fifty states, it is hypothesized, would reveal some significant

proportion of current senior level workers (who may act as opinion leaders within their departments and sections) engaged in interaction with the environmental movement at the time of its origins and who continue in similar efforts to affect the current environmental movement. These limited findings suggest that a study could be designed to assess these and other various ways incumbents might affect the social movement whose goals they carry. To the extent that such interactive effects are important - to understanding the continuing movement, the position characteristics, and the incumbents, e.g., as a cohort - this underresearched question in the program professional model deserves further study.

Other ways in which water quality environmental management positions and the characteristics of the initial incumbents might affect the environmental movement include: ways the position might link to social movement organizations (providing evidence, expert opinion, trend spotting, reports on local, state and national politics, etc.); ways in which the initial incumbents might link to social movement activity (off work involvements, non-work testimony, writing briefs or further legislation, etc.); informal influences of the position (media reporting on work or conditions, informal network aspects of the position, e.g., on consultants, lobbyists, etc.).

Evidence in this case-study for these other ways in which water quality environmental management positions and characteristics of the initial incumbents affect the environmental movement come primarily from participant observation and from the intensive interviews where anecdotes were given suggesting these influences. For example, the author made a canoe trip down a major mid-Michigan river in the early 1980s with one of the initial incumbents who conducted observations (sight and smell) of septic levels. This person was simultaneously working on a research paper on the water quality of Michigan rivers that was subsequently delivered at a meeting of environmentalists. It can be presumed that in such cases

there would be contacts between such persons and the environmental movement lobby groups. Presumably, in general, such meetings serve to update information regarding environmental matters, and relaying of information over the years by initial incumbents to the lobbyists in such informal meetings and in professional association networking has been important. Another more recent observation was made by the author in the spring of 1991 when he attended a public hearing conducted by the Michigan Water Resource Commission (WRC). In this meeting the Commission was taking testimony surrounding a proposal to change the WRC administrative rules: before the WRC itself adjudicated individual appeals by polluters, the new rule would establish an expert advisory committee which would make an arbitration (typically of pollution levels). Mid-Michigan Surface Water Division workers the author was in contact with were concerned that this change, lobbied for by the new Republican Governor in the name of efficiency, would work to reduce the type of decentralized participation by the general public and by environmental lobbyists that typically occurred in the WRC hearings. The proposed rule change would substitute a more centralized process of arbitration by the expert committee. In this case, while the unit workers did not want to show up at the somewhat volatile WRC meetings for fear of jeopardizing their officially neutral position, the author himself served as the informant and conduit of "news from the front". This is, however, an example of an interactive effect. Further research could be designed which would involve focused interviews with senior workers on their relationships to lobby organizations; interviews with university based senior professors who have seen some of these interactive effects; more focused interviews with a larger sample of senior water quality environmental managers around historical questions of interactive effects; more secondary sources, including memoirs, books, trade journals and magazine reports.

Short of such a major study, we can make some presumptive hypotheses on the basis of the evidence we do have: the initial positions have

figured in a "social problem process" - once the position is there, players in the public arena, such as environmental lobby groups and grass-roots movements, can interact with incumbents in the initial position, can pressure them, can media-ize the role. This lobbying effort, in turn helps create an "expert" who can act back upon the movement in various ways, including giving "testimony". (For a general discussion of this see Scott on the "new federal model") (Scott, 1983).

Other evidence of this interactive effect is contained in the intensive interviews, where many anecdotes were given about the role of the DNR water quality manager in the many public hearings held over WWTP construction plans. An example of how the attributes of the initial position may interact with the environmental movement is contained in the many steps in a project including the requirement for public hearings. At such hearings testimony is given by local citizens, city and plant officials, politicians and environmental associations. These public hearings are often "news" and are attended by local reporters. Newspaper articles may follow up with interviews with DNR water quality specialists. In the hearings themselves key informants report that the state DNR is often held up in esteem as the "good guy", with politicians, developers and even the EPA cast as the "bad guys".

Other effects of the initial incumbents on the environmental movement include influence on the early development of interdisciplinary environmental fields, e.g., "comprehensive" water quality planning. This interactive effect of initial incumbents in an emerging occupation with the "imminent" knowledge process was brought out in earlier studies such as Ross (1975) in the "advocate planner" 'profession in process', and Bucher (1961) on knowledge specialty "segments". Wilensky commented on the different program professional roles of "cosmopolitans vs. locals", e.g., characteristics of initial incumbents were more organizational and "local" than professional. On this theoretical basis we might expect some of the influence of initial incumbents on social movements to be at the

organization-level, e.g., developing the interdisciplinary knowledge for the hybrid "new, mixed professions". Some of the publications of initial incumbents include organizational questions. For example, giving papers at professional meetings. Several key informants have done this. While this indicates the "professional" pole of Wilensky's three part mix of the mixed new professions, it may also indicate the "movement" dimension. The topics of the papers may report on the incumbents' experience in the position and outline current issues relevant to the agenda of the environmental movement. The characteristics of the incumbents include having been influenced by the environmental movement, and carrying movement goals as individual goals. Intensive interviews indicate senior workers were often thinking of being in emerging positions and maturing in the position as a way not only of fulfilling organizational goals and professional goals, but also as a way to represent feedback to or affect the environmental movement.

The degree of influence of the initial incumbents and the attributes of the initial positions on the direction, change and evolution in the environmental movement is captured most poignantly in the concept of an occupational emergence from "amateur to occupation" as a "profession in process." While this question is dealt with at more length in part III of our three-step model, clearly there is a need for more research on this question. The implications of the "program professional role", of the interactive effects, and of the meaning of "occupationalization" for the environmental movement can only be suggested in this study. Many local associations grew rapidly to become national associations during the period (1972-1982) in which these new positions were being institutionalized - a period, as mentioned, in which the environmental movement itself went through two transitions, first from a mobilization stage to a power phase, and second, a revitalization phase in the face of anti-regulatory counter-movements. A lot of lobbying and social problems

processes were occurring in this period. To establish input from early incumbents to the environmental movement would require interviews with a large sample of senior workers. Our few key informants, however, have provided some indications of this phenomenon. Once the initial positions were established, once the initial incumbents were in place, and after some of the early interactive effects with, and influences of, the environmental movement had taken their course, a distinct "definition" of the position had occurred. What was the "origins effect" of this position on subsequent developments of the role? Once the early experiences of the environmental movement had influenced the initial incumbents and they were in the role how did their characteristics affect subsequent development of the role? Were there continuing influences of the social movement? Some of these questions have already been raised in our discussion so far, however, we need to examine the notion of a distinct "origin effects" more closely. To this we now turn.

STEP TWO: ORIGINS EFFECT

As federal water policy shifted, adding the new phase of regulation to the older emphases of development and coordination, our data suggest that an origins effect was occurring. The new federal and state level reorganizations were taking place in an atmosphere of social movement: new institutions, new values, new organizations, and new roles were being forged. As Stinchcombe observed (1965), there often is an "origins effect", that occurs when a new organization is founded - a structural and cultural effect which persists over decades, influencing subsequent developments. The founding of a new institution (eg., EPA), a new program (eg., comprehensive planning and the grants program), or new roles (eg., WWT water quality environmental manager roles) always occurs in a cultural context of originating values, norms, beliefs, laws and rules that give meaning to social structure and with a social structural phenomenon of new statuses, roles, or expectations producing routine patterns of behavior. And such cultural and structural founding patterns or origins effect may

also be accompanied by initial incumbents who may become a generational cohort.

Cultural Origins Effect

Founding Values, Norms, Beliefs, Rules and Laws. Many of the observers of the early environmental movement (Schnaiberg, 1980; Dunlap and Mertig, 1992; Foster and Rogers, 1988) noted the strong radicalized values of the day. The theme of "Earth Day", while ecumenical and inclusive, was also a theme that industrialized society had reached a point where "business as usual" could not continue. The addition of comprehensive environmental planning to the traditional water policy goals of developing resources and coordinating efforts was an addition that came with strong programmatic values: clean up the water - rivers should be swimmable and fishable by a certain date, and not too far off in the future. Action now was the call of the day. Tremendous resources and energy were put to the task. The universities started up new bachelor and graduate programs in environmental management (Disinger and Schoenfeld, 1987). It was especially on college and university campuses that this radicalized sensibility prevailed with a persistence of a "change the world" sentiment. That is, a value-creation process, a "society making" movement identity (Hannigan, 1985).

The new laws (NEPA, 1969; Clean Water Act, 1972 and 1977 as amended) mandated that all point-source effluent (all pipes, culverts and drains) be subject to a permitting system: they had to be examined and monitored for mandated levels of water quality leading to "zero-pollution" within certain dates. All water-related development or projects (WWT plants, highways, harbor improvements, land developments, etc.) were required to have "environmental impact statements" (EIS) performed by legally mandated personnel. To back up the mandated comprehensive planning and requirements to reduce effluent pollution to meet new water quality standards, a level-funded federal grants policy was initiated in the most obvious area of water pollution - the inadequate municipal wastewater treatment facilities

of American cities, towns and villages. Program funding in this newly expanded federal program carried with it numerous subnorms of how to conform to the grants program. This bureaucratic institutionalization of part of the environmental movement into the new federal model normative structure of experts monitoring and rectifying a social problem involved the new positions with new laws, and new social scripts on the cultural level: the "rational myth" of expertise was now applied to water quality in an aggressive way it had never been applied before. What patterns of new routine behavior relevant to occupational emergence accompanied the new cultural action?

Social Structural Origins Effect

The new laws (1969 NEPA, 1972 Clean Water Act as amended 1977) created many "bureaucratic hat" water quality positions working around permit standards and funding processes. The shift from "died-in-the-wool" engineer (such as municipal facilities planner and operations regulator) to environmentalist positions (involving, e.g., water quality permitting and environmental impact statements) was a shift from more-or-less traditional engineering and hard science (eg., chemistry and some biology) fields to multidisciplinary work. These new multidisciplinary approaches, however, did not have clear, well-established (institutionalized), paths of career development in contrast to the straight-forward, municipal facilities, civil engineering types of work. Even in the early 1990s, university faculty working in the resource development field, and advising the many new students being placed in environmental jobs, worry about this unclear career path and feel there is a need for presenting such multidisciplinary positions as a career (Dersch, 1990b). Thus, the initial definitions of the positions, based in bureaucratic roles in comprehensive planning programs and drawing from a multidisciplinary approach, have affected the subsequent difficulties in developing an occupational career path. This becomes particularly important to senior divisional workers at the mid-career stage.

The new federal programs of the 1960's and early 1970's often set up positions that were vague in this career sense: with specific missions - to plan, to monitor, to coordinate, to facilitate, to engage in new procedures (environmental impact statements, managing program planning steps), to enforce new or changing standards - but without traditional career paths. Such program manager positions were frequently slots in a type of "institutionalized organization" (Scott, 1981, 123-125) that had no clear career path. However, the water quality programs of this period (1977-onward) were long-term and have had a significant "technical organization" dimension: permit standards, environmental impact assessment, and other technical considerations of water quality and the planning process. Both institutional factors (social movement public pressure for an environmental management role) and technical factors (growth of knowledge and complexity) may be assumed to be building pressure for clearer career paths.

The origins effect of the water quality positions emerging as interdisciplinary types of work in federal and state civil service bureaucratic positions has meant that there has been some inertial tendency in water quality organizations (Hannan and Freeman, 1977). That is, the nature of the initial position has affected the subsequent development of it with an inertial tendency to remain a vague, interdisciplinary, bureaucratic "environmental program" role. This is an important origins effect for the questions of occupational emergence. On the other hand, there have been some counter-pressures acting to facilitate the emergence of occupations, for example, as increasing cross-media management (interactions between air, water, runoff, toxics, groundwater, landfills) occurs there is a build-up of interdisciplinary and cross-section social contacts. These patterns of social structure may also link to increasing meaningfulness (culture) to the extent that cross-media management facilitates group consciousness. Additional impetus to the development of social structural supports comes from the growth in

knowledge surrounding measurement. For example, as measurement abilities in water quality become greater, standards receive more "professional" activity - more scientific papers, more precise routines of behavior, more group consciousness of common occupational focus. However, there are not only cultural and structural dimensions of an origins effect for environmental management, there may also well be a population phenomenon at work - the phenomenon of a distinct generational cohort.

Population Level Origins Effect

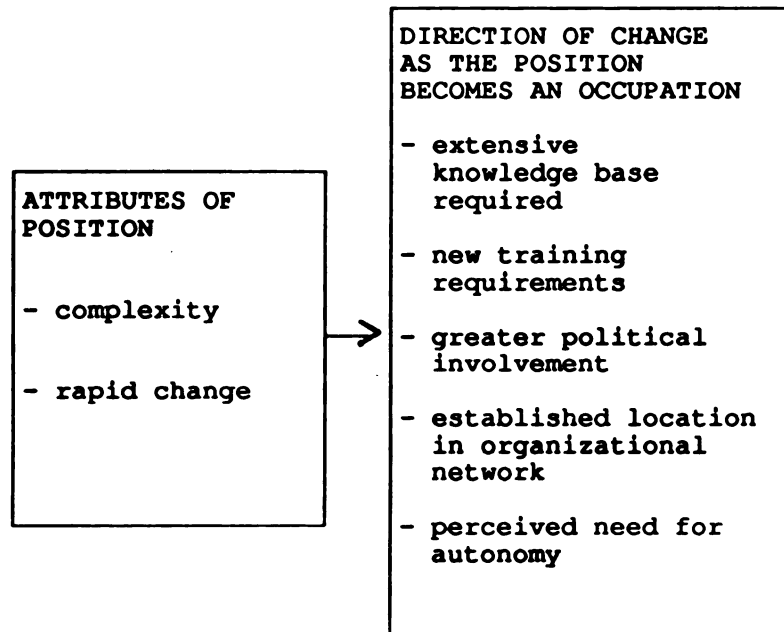
While most literature in management and organization theory in recent years has been emphasizing organizational culture, organizational learning, and the importance of cultural and social origins effects on subsequent performance, the aspect of distinct cohorts as an element of origins effects - whether job cohorts or generational cohorts - is understudied. The question of generational cohort seems especially appropriate in cases where the socio-cultural dimension includes a significant external set of historical events, such as major social movements, which might influence a generation moving through the emergence of an occupation, and have an influence on that position's subsequent development. It is to these questions of structural, cohort and movement effects that we now turn in our step-two analysis of the emergence of an occupation.

Research Question #4: How did the initial definition of the position affect subsequent developments of it? (origins effect)

This research question directs us to examine in a more focused way what the initial cultural and structural definition of the position was and whether this "definition of the position" had subsequent influence, as an origins effect, on the development of the position. It is also hypothesized that the attributes of the initial incumbents constitute an origins effect. However, this question will be dealt with later as a cohort effect. The nature of the line of influence of the initial

attributes of the position on the direction of change in our expected causal model for this question is indicated in Figure 7, below.

Figure 7: Influence of attributes of the initial position as a structural and cultural "origins effect" dimension on direction of change as the position becomes an occupation



Two main attributes of the initial position created a distinct origins effect and have contributed to the direction of change in the position. First, the addition of environmental impact statements (EIS), new water quality standards to write permits for, and the need to do comprehensive planning which requires more contacts all contribute to increased complexity. The work jurisdiction of the incumbents involved environmental impact complexity, standards and permit complexity, and planning complexity. Secondly, the new (or altered) positions were systematically affected by the degree and rate of change in both environmental problems and the legal and political response to them.

Our data indicate that many cultural and structural aspects typical of an origins effect were significant in the attitudes of initial

incumbents in these positions. The social movement influenced regulation phase of U.S. water policy created new positions. As early as 1965 pre-existing positions were beginning to be required to do "principals and standards" reports (new water quality reports). Environmental impact statements started in the period 1972 to 1977. These new structural requirements resulted in hiring-in to the WWT grants program and to surface water divisions more "soft" roles - planners and biologists - versus the previous staffing patterns of mostly "hard" roles, for example, engineers. One key informant noted:

There are three groups in the DNR: planners, engineers and biologists. It used to be the engineers controlled things. Now it's more equal.

Survey questionnaire results were broken down into 1st cohort (N = 29), (senior workers with six or more years in water quality work) and 2nd cohort (N = 20), (five or less years). Survey questions - How long have you been in water quality work? What types of knowledge, paperwork, contact changes in water quality jobs have you seen? and What other kinds of changes have you seen - were tabulated.

One of the attributes of the initial position was its complexity. Has this characteristic at origin had subsequent effects on the development of the position? For the first cohort, our survey data show that 79% report a large increase or somewhat of an increase in types of knowledge required. Environmental/ecological and legal/regulatory and organizational knowledge seem to have increased for most respondents more than technical knowledge. Another type of complexity of the initial position involved its position in an organizational network. One feature of organizational field complexity is the amount of paperwork involved. Seventy-two percent of the senior cohort report there has been an increase in the amount of paperwork required; and 56% report some increase or a large increase in the amount of contact with external environmental lobbies and/or pressure groups changed. We can conclude from these results that for the senior cohort knowledge requirements have increased in the

ecological and legal/regulatory areas, and that complexity has increased in the realm of the organizational field paperwork and contacts.

In answer to the question, "What other kinds of changes do you perceive in the nature of your water quality related job(s) over recent years?", the senior worker cohort often responded with comments confirming the hypothesis that the structural and cultural origin characteristics of the initial position have had influences on subsequent developments in the position in four areas: increase in complexity, knowledge, and public contact, and the continuing political character of the work. Some of the comments are included in List 1, below.

List 1. Mid-Michigan Surface Water Division workers comments on kinds of changes perceived in water quality related jobs over recent years.

- Things are more complex
- Much more public involvement required
- Focus on annual activities changes with source of funding monies. Also has changed as the degree/perception of environment hazards has changed
- Need for continued training
- Excessive regulations and reliance on computer models instead of practical observations
- The amount of knowledge required to perform minimally acceptable work has not changed . . . But, the more knowledge you have in all three areas the better you are able to do your job. (Also) Simple water quality problems have been solved (point-source). We are now dealing with more complex problems, primarily non-point pollution.
- Dynamic modeling (has developed)
- The change in political climate in Michigan may have a direct impact on the direction of water quality programs in the near future (negative impact).
- Much more regulatory in nature and involved with attorneys more than engineers
- There has been a very large increase of knowledge in the area of toxic pollutant control. (And) the need for public information is greater now than it has been in previous years
- Public is more educated so questions are more specific and technical. Rapport is interesting
- More use of aquatic toxicity testing requirements in permits
- No change other than (my) changing jobs. The water quality field seems more stable than some other environmental fields
- Not much change. Also, changes in the program depend on the changes in the environmental laws
- I notice that more and more of the decisions are politically based rather than technically based
- I have to be an expert in more areas every year
- More political control in environmental decision making process

List 1 (cont'd).

- Away from specifics, i.e., end of pipe to larger basin-wide effects, eg., nonpoint source, hydrological changes, sedimentation less toxics
- The job has become a technician's job which requires following procedures and little else
- Doing bureaucracy and PR is more important than doing good science. Its more important to feel good about water quality than to have any in depth understanding of it
- Increased emphasis on cleanups of toxic chemicals. With Engler in office, shift in emphasis from protect environment to protect business
- We've become a paper bureaucracy. Computer training and knowledge is essential.
- Much more effort to include and interact with the public.

One interpretation of these results is that such comments show that several of the characteristics of the initial positions have had an impact on the subsequent development of the position. The permit system has implicated the positions in more ecological and legal knowledge, and in more paperwork and public contact. More ecological knowledge stems directly from the establishment of positions monitoring water quality standards; the permitting system, requirements for environmental impact statements, and justification of decisions made implicates the position increasingly in legal knowledge, public contact and paperwork. On the other hand these same bureaucratic dimensions contribute to continuing tendencies toward purely technical work, although this may affect some surface water positions more than others.

Composite interview data of all 22 municipal facilities unit workers conducted for the organizational development project in that unit in 1987 revealed a perception of limited authority. Unit water quality workers wanted to be included in decision-making relevant to their projects - decisions that were being made exclusively by higher levels. Decision-making meetings at the section, division and departmental level that excluded unit-level project managers demonstrated one aspect of the limited authority of clean water managers. Increases in knowledge, complexity of contacts, and rapid change, it was argued, made unit-level project managers as knowledgeable if not more knowledgeable than higher

level managers about specific projects. Interview comments also revealed some frustration at the political nature of state civil service work, leading to another dimension of limited authority. Michigan is a strongly environment-oriented, outdoor recreation, mid-west tourist state of much rural beauty. As a state, Michigan had developed over many decades a diverse, decentralized and effective, environmental decision-making process which included many independent councils, committees and commissions. Environmental managers would give testimony in this decentralized environmental process. However, after the 1990 election the new Republican Governor, John Engler, pushed to eliminate this "inefficient", decentralized environmental process, also arguing it gave too much power to environmental lobbies and sought, instead, to centralize all interpretation and enforcement of environmental law under one Governor-appointed departmental process (a board of appointed experts). This effort failed, meeting with stiff resistance from many quarters. But in California, in the late 1980s and early 1990s, many environmental managers feel their authority is limited by a Republican administration that has made political appointments to head environmental and recreation departments. In California, under Governor Pete Wilson (who himself passed some limits-to-growth legislation), there has been, in short, a pattern of top environmental bureaucracies headed by "political hacks and cronies who are controlled by the land developers" (Martin, 1992).

Under these often political circumstances, and given the narrow permit-based water quality standards work jurisdiction, clean water managers continue to be affected by the limited authority attribute of the initial position. We have noted how the initial position, narrow permit-based work jurisdiction and interdisciplinary nature of many job slots creates limited career steps. At the same time the position is subject to rapid change due to growth in water quality knowledge, shifts in public and environmental movement attention to different types of environmental crises, changing laws and increasing complexity due to organizational

field complexity and increasing contacts with the job-related network. Intensive interviews reveal complaints about lack of time or encouragement for study-time to keep up with the growth of knowledge, release time to speak at high schools, colleges or universities, on-the-job time to prepare research articles, departmental or division sponsorship of brown bag seminars, travel to national meetings, and other professional-like activity. This perception of lack of encouraging conditions for intra-positional mobility may represent an important direction for applied research to explore further, and the future prospects of increased intra-positional mobility may depend on the clean water managers ability to "be political."

The sensitivity of environmental decisions has led, at various times, to periods of politicization, e.g., the resistance to early Reagan years counter-movement and more recently for our sample in a frustration with some of the policies of the Michigan Republican Governor John Engler, elected in 1990. In the earlier, Reagan-years case, the counter-movement led to a type of environmental movement revitalization that, in general, aimed to protect existing programs and labor market positions. The impact of current politics on the environmental movement in Michigan remains to be seen, there has already been some patterns of resistance. But the occupational development of water quality environmental managers may require an additional (internal and external movement) focus on the issue of intra-positional mobility. This program professional goal may partly depend upon the question of the characteristics of the senior worker first cohort and their occupational capacities.

In summary, we can emphasize that the shift from "engineering" roles toward including more "environmental" roles in wastewater treatment, and surface water work generally, was not simply a change - it was a type of cultural and structural reorganization, influenced by the environmental movement, that was a period of origins effect. Such origins effects have figured prominently in the organizational literature as having important

independent effects on work organization and occupations. The attributes of the initial position, through cultural meaning and social structural patterns of routine behavior have led - as an origins effect - to observable consequences in the direction of the change in the position as it becomes an occupation.

Two specific attributes constituting this origins effect are complexity, and rapid change. We have argued that new water quality reports and standards, EIS, and more planning all led to an initial complexity in the new positions. Partly because of complexity related to measurement and knowledge around impact statements, standards and planning, and partly as a consequence of the new academic-based ecology fields being added to the knowledge base, a further growth in the knowledge base was built-in to the new positions. These new, environmentally focussed positions were also subject to more rapid change than the previous engineering focus of the prior positions. It has been the case that continuous new problems and opportunities - new environmental crises, new types of pollution, new computer-based technologies of monitoring and measurement, and so forth - have served as an origins effect. These origins effects have all influenced the subsequent direction of change in the position as it became an occupation. As we will see, the increased knowledge required and associated training needs contribute to development of social structure around the position. Also, political involvement, an established location in an organizational network, and a perceived need for positional autonomy could be expected to produce group consciousness of an occupational identity.

There is also the question of how this origins effect period may have influenced the initial incumbents of these positions as a cohort, and the extent to which they may have influenced the development of the role. To this question we now turn.

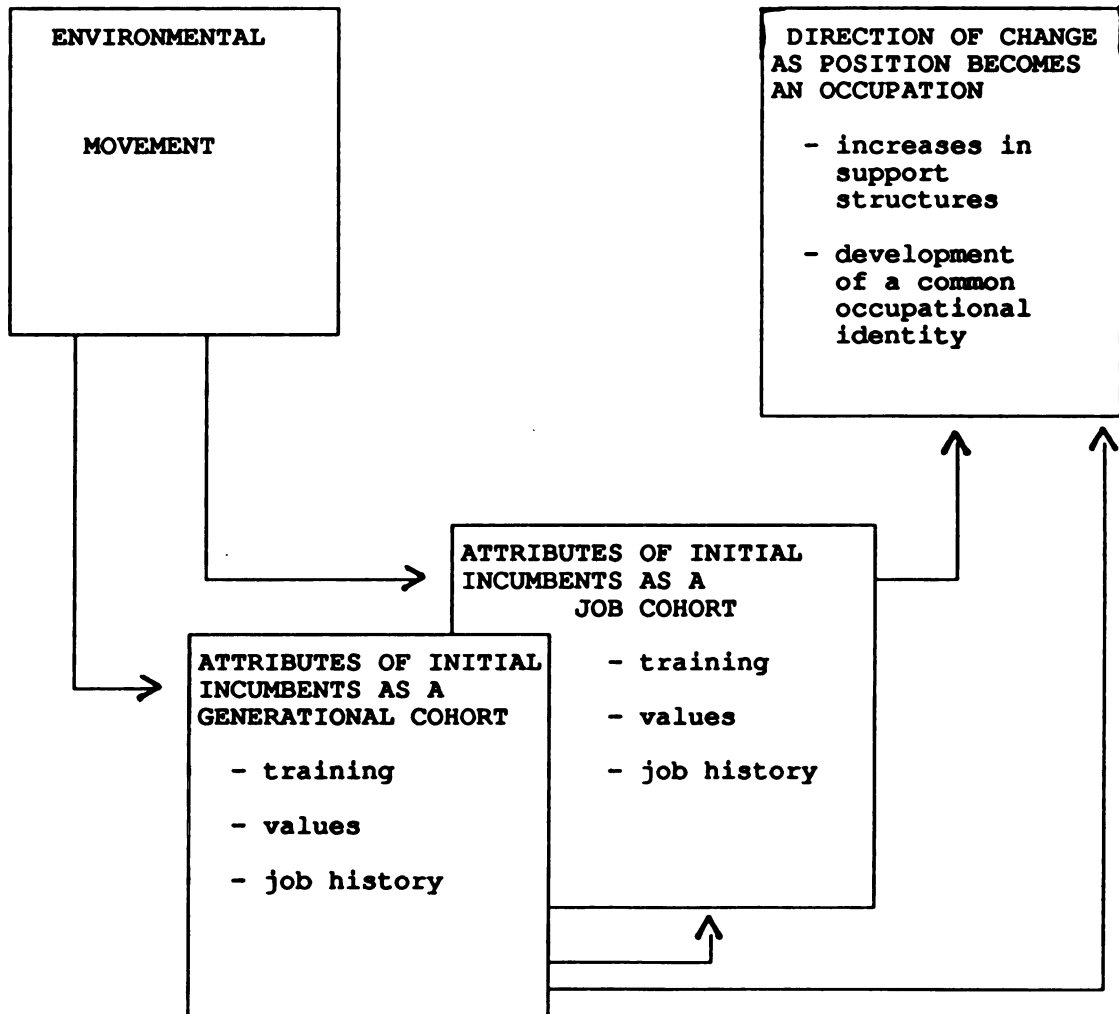
Research Question #5: How did the characteristics of the initial role incumbents affect subsequent development of the role? (cohort effect)

Our fifth research question directs our attention to a more detailed analysis of possible population level effects in the emergence of an occupation. For example, if initial incumbents stay in the roles, environmental management jobs may be influenced by a generational cohort. But we find we must focus our examination in a way that can distinguish between job cohort (length of time in water quality work) and true generational cohort (persons influenced in common by historical events and having some consciousness of themselves as a group). This distinction is indicated in Figure 8, below.

The degree to which the attributes of the initial role incumbents influenced the attributes of subsequent development of initial positions (cohort effect) is a difficult research question and would require more in-depth biographies and more thorough historical research than is possible in this study. Yet we have indicated that in the intensive interviews with the key informants we were able to establish that these senior workers were influenced in their values by the environmental movement, and that they continue to carry movement goals as their own - an important dimension of the program professional.

Implicit in Wilensky's (1964) discussion of the mixed, new professions as program professionals is an unelaborated hypothesis that such initial role incumbents of newly forming mixtures of social movement, professional and organizational goals were becoming or could become a generational cohort. The individuals in this cohort would affect subsequent developments of the new, mixed profession by keeping the social movement goals intact - they would become "models of the link between culture and politics: people of knowledge and people of action." Such "sticking with the program" does seem to characterize our key informants and many of the senior worker cohort.

Figure 8. Characteristics of senior workers as a job cohort and as a generational cohort that may affect subsequent development of the role.



The senior worker cohort was defined as individuals who entered the DNR water quality position six or more years before 1992. However, while this may be a useful demarcation for a job cohort, we need a different time line for initial incumbents. Significant legislation was occurring in 1965, 1969, 1972 and 1977. It seems that to assess the characteristics of initial role incumbents we would need to restrict our analysis to individuals coming into the DNR water quality programs or beginning direct water quality regulatory work outside the DNR before 1980 - before the cutbacks, retrenchment, counter-movement program shifts, and subsequent reactions and revitalization of the environmental movement were taking place since these events signaled a different era, an era that came after initial incumbents would have been in the early program roles.

The argument for demarcating a senior worker generational first cohort is justifiable on other grounds too. The new university programs were only beginning to start up by 1977 and the new crop of graduates coming into the DNR positions after 1981 could be argued to be a different, second generational cohort, or at least somewhat different from those with primary experiences in the 1960s and 1970s. It could be assumed such a second cohort were more influenced by new university programs, and had somewhat more orderly career lines, but on other hand, as a younger category, were less influenced by the origins effect and the late 1960s, early 1970s environmental movement. The second cohort could be more influenced by their period of entry into the job - as a job cohort, maturing in the already established positions - whereas the generational first cohort was more influenced during the origins effect and carry more "generational unit" potential. If we follow this "first generational cohort" logic (instead of a job cohort logic), our initial incumbents would be visible as at an age and with years in the program (in the distribution of our survey sample) as a mode cutting off at 13 years or more experience in regulatory water quality work. We would call our earlier cutoff at 6 or more years in water quality regulatory work a

senior worker job cohort, or a "job first cohort" (N = 29), and our second mode, cutting off at 13 or more years, as a senior worker generational cohort, or a "generational first cohort". This "true" first generational cohort is 31% of the Lansing based DNR Surface Water Quality workers, an N of 20 in the survey sample.

What are the biographic characteristics of these initial incumbents? If we examine the previous employment records we get an overview. Composite work histories will be presented below as "cases" representative of the "senior worker first generational cohort", where "initial incumbent" means in a regulatory DNR (or private sector) water quality job or program position prior to 1981. Illustrative case examples are listed below.

Case 1A: Conducted various fish population assessment studies as a student assistant (1979-1981), then conducted environmental assessments and aquatic research for a multi-county regional planning agency as a regional environmental planner (1982-1983), then planned and managed a multidisciplinary project for an environmental consulting firm as a senior fisheries scientist (1983-1985). Now works as an aquatic biologist for the DNR engaged in development and implementation of remedial action plans, environmental assessment studies, and writing reports.

Case 1B: Received an M.S. degree in aquatic biology in 1975 and a Ph.D. in stream ecology in 1982. From 1982 to 1988 was a research assistant at a university in the water quality area, from 1988 to 1992 (current) conducts biological surveys and reviews discharge permits for the Michigan DNR.

Comment. While the work history of the first person is 10 years rather than 13 years, the early work as a student assistant for three years was in water quality. This would be a border line case: is this person "job first cohort" or "generational first cohort"? The second person, while she or he has been in regulatory water quality work for the DNR only 9 years, has the Ph.D. and M.S. work in stream ecology/aquatic biology from the mid-1970s to 1982. This person may qualify as a senior worker generational cohort in the sense of being "present at the creation" of positions by being in advanced water quality study and research, but looking on from the academic world.

The next case is a clear example of a generational first cohort.

Case 2: Conducted water quality analysis for potable water for a large city as a chemist (1967-68), then was engaged in field duties enforcing water pollution laws as a water quality specialist for the DNR (1972-1976), then conducted studies of fish contaminants as a lab coordinator and lab scientist for the DNR (1977-1984). Currently

monitoring water as a commuter coordinator for storage and retrieval of water data for DNR (Water Quality analyst), 1987-1992 (current).

Comment. The person in case #2 was clearly engaged in water quality regulatory work prior to 1980 and is also of an age to have been affected by the rise of the environmental movement of the late 1960s and early 1970s.

Case 3: Student, field research assistant, and graduate teaching in water quality field (1961-1966), then research assistant evaluating pesticides and assisting in lab teaching (university entomology department), 1967-1972. Now conducting lake and stream surveys to determine status "of effects of man's activities" (1972-current).

Case 4: Conducted biological surveys as a district biologist for the DNR (Aquatic Biologist VI), 1978-1984, developed water quality based recommendations for toxics, conducted toxicological investigations asst. Aquatic Biologist VII (DNR, 1984-1989), currently Aquatic Biologist Manager VIII (DNR 1989-1992, current), managing Michigan's fish contaminant monitoring program, managing Region I & II biological assessment related work.

Case 5: Civil engineer working on highway drainage, 1967-1979, then environmental engineer working on facilities design, plans review, 1979-1985, currently working as an Environmental Engineer VII Permits Writer, (1985-1992, current).

Case 6: Environmental Engineer, design of water systems and wastewater facilities for state parks (1973-1978), environmental engineer reviewing plans and specifications and other related documents for state construction permits for municipal wastewater projects, 1978-1982, Environmental Engineer working as staff specialist in the industrial wastewater discharge permit program (1982-1992, current).

Case 7: Lab technician 1973 to 1978, then Environmental Quality Analyst issuing permits to industries to discharge treated wastewater into state waters, setting limitations, monitoring requirements, 1978 to 1992, current.

Case 8: Received a B.S. in aquatic biology in 1975, worked as a chemical technician 1976-1989, employer was an industrial parts manufacturer, performed all environmental activities: all chem lab activities including wastewater analysis, maintenance and inspection of coolants, cooling towers, oils, greases, gases and some metallurgy ("catchall position"), then worked as Environmental Quality Analyst VI for DNR developing NPDES permits, technical assistance to unit on groundwater cleanup permits, 1989-1992, current.

Comment: This person was not in a DNR position until 1989, but was engaged in water quality regulatory work keeping company in compliance with regulations. Early degree (1975) in aquatic biology and indicated "my desire to work in the environmental field" as one reason for continuing regulatory work in the DNR. (Note: while most work experience of respondents was primarily in the state civil service, municipal positions, or university departments, the role of environmental managers in private companies and as consultants has grown, should be included as part of the "generational first cohort", and requires additional study.

Case 9: Environmental sanitarian, 1970-1987, specialized in several

environmental protection programs such as: on-site wwt and disposal, water supply and groundwater protection, solid and hazardous wastes. Then Environmental Quality Analyst, NPDES permit processor (1987 to 1992, current).

Case 10: Environmental Engineer, 1972 to 1978, for permit section of air quality division, DNR. (Project coordinator for incineration of PBB infected animals), then Hazardous Waste Engineering Specialist for DNR Environmental Protection Bureau (1978-82). Then (1982-83) reviewed engineering designs and issued Act 98 permits for sewage collection systems, wwtp air cleaning equipment and municipal sludge incinerators. Municipal Design Review, Water Quality Division, then (1983-1988), Surface Water Quality Division effluent guidelines, then (1988-1992, current) Environmental Engineer reviewing permit applications, hold public meetings and hearings, plant visits, plan review.

Comment: In this case the person worked in air quality regulation and hazardous waste until 1982, and has worked partly in air quality after that date. Moreover, the person reports "I chose to work as an environmental professional in another field (Hazardous waste), I bumped into this position." On the one hand since cross-media management is increasingly important (air pollutants and hazardous wastes affect water quality) this type of work history seems to qualify as a borderline generational first cohort for clean water management. On the other hand, the case is useful to include because it shows some of the conditions for career paths in environmental management, eg., "bumping" during a state recession (during 1980-1983) that led to massive layoffs of many (and bumping downward or horizontally to available positions by high seniority civil service workers). Work conditions and career paths for "program professionals" working in the public sector needs to include attention to conditions like these and analysis of their effects on occupationalizing.

Case 11: General Engineer IV (1977-1979), area engineer for a 10-county area promoting water supply and distribution systems for the Water Supply Division, Michigan Dept. of Public Health, then Environmental Engineer VII senior worker drafting NPDES permits, (1979-1992, current).

Case 12: Lab technician (1976-78) performing biomedical lab tests related to cancer research, then Environmental Quality Analyst doing water quality studies on Michigan streams, recommending permit limits (1978-1992, current).

Case 13: Operations coordinator (1971-1980), involved in all aspects of a municipal WWTP, then Wastewater Specialist WWTP operator training, certification, and technical assistance (1980-1992, current).

Case 14: Environmental Policy Consultant (1978-1985). Performed various studies and prepared reports on a contractual basis for MDNR, Michigan Public Service Commission, U.S. Dept. of Commerce, etc., then Regulatory Analyst (1986-1990) for another state DNR drafting regulations and legislation, then Environmental Quality Analyst VI "project manager."

Comment: This person worked in the environmental regulatory field as a consultant. Given the survey reports of increased knowledge in the legal/regulatory field along with increases in ecological

knowledge, and given the increase in consulting roles as ancillary roles accompanying the emergence of clean water managers this person may qualify as a senior worker, generational first cohort, initial incumbent. The case(s) of consultant roles is an area in need of further research.

Case 15: Student intern/creel clerk (summer, 1978), conducting creel surveys fisheries research, Research Assistant for the DNR (1979-1985), currently doing toxicity tests of wastewater effluents and act as an aquatic toxicology expert for the department (Aquatic Biologist VIB), (1985-1992, current).

These composite cases represent the actual range of work histories and academic degrees typical in the senior worker, first generational cohort (5 overlapped sufficiently that only 15 are reported). Types of degrees and types of jobs of the generational first cohort in our sample are given in Table 1 and List 2, below.

Our research question asks how the characteristics of the initial incumbents may have affected subsequent developments of the role. To assess the generational cohort effect we must ask "Where do these individual initial incumbents come into the story of the environmental movement"? . Schnaiberg (1980) broke down the social movement orientations of the 1970s phase of the environmental movement into four types: cosmetologists, meliorists, reformists and radicals. In the early period the base of the movement was composed mostly of cosmetologists and meliorists with strategies aimed at mass consumer education. For example, in the early 1960s part of the history of civil engineering dealing with wastewater treatment plants, water quality discussions became concerned with detergents as a water quality problem. At first, this was approached as an engineering problem - a problem to be handled by better WWT plant filtration. Later, by 1963-1964, as the consumer education strategy of the early environmental movement grew in influence, the definition of the problem, as reflected in the sanitary engineering literature, shifted from the need for an engineering solution to the need for increased public regulation of the detergent manufacturers. This is an example of the

Table 1. Types and frequency of academic degrees of mid-Michigan Surface Water Quality Division senior worker generational first cohort.

Frequency of Academic Degrees by Type				
Degree	B.S.	M.S. or	M.A.	Ph.D.
Aquatic Studies				
- Fisheries & Wildlife	4	1		
- Fisheries & Limnology	2			
- Aquatic Biology	2			
- Stream Ecology	1	1		1
Biology (or env. biology)	7	1		
Chemistry	1	1		
Chemical Engineering	1	1		
Entomology	1	1		
Environmental Law & Policy		1		
Environmental Resource Mgt.	2	1		
Geography	1			2
Home Economics	1	1		
Resource Development	2			
Sanitary Engineering		1		
Soil Science (irrigation)		1		
Zoophysiology	1			

* Some respondents have more than one undergraduate degree which explains why total bachelor's degrees add up to more than 20.

List 2. Type and frequency of jobs of mid-Michigan Surface Water Division senior worker generational first cohort (N = 20) [13 or more years in regulatory water quality work].

Type and Frequency of Jobs	
Type	Frequency
<hr/>	
Aquatic research in lab setting (eg., chemical and toxicity tests of wastewater effluents) [may involve acting as aquatic toxicology expert]	5
Chemical technician, water quality work with a private enterprise (eg., manufacturing)	1
Design of wastewater facilities or other water systems (e.g., parks, cities)	2
Environmental assessment	1
Environmental engineering work in industrial wastewater discharge permit program	2
Environmental engineering as project manager, working on facilities design and plans review (WWTP, drains, sludge)	4
Environmental (NPDES) permit writer (eg., surface water or ground water effluent guidances or permits)	7
Environmental policy consultant work (for various agencies and/or private consultants)	1
Fieldwork water quality survey duties enforcing water pollution laws (eg., lake and stream biological surveys)	1
Graduate teaching in water quality field	1
Management work coordinating staff and water quality programs (eg., regional biological assessment)	2
Regulatory analyst (drafting regulations and legislation)	1

general shift from an engineering to a regulatory orientation which becomes the origins effect for our clean water managers. During the later 1960's ecological perception deepened more. Schnaiberg observed that by then the meliorists and reformists had come to form a larger part of the movement and that a shift toward legislation and litigation began occurring. He notes,

By the early 1970s, most cosmetologists had dropped out, some meliorists had either dropped out or become reformists or even radicals, and reformists and (to a lesser extent) radicals began to constitute the bulk of the movement. . . the radical component of the movement was disillusioned with the small production changes imposed by NEPA and related Acts . . . In contrast, reformists had the task of dealing ever more directly with representatives of major production interests in their efforts to seek enforcement of existing legislation and new legislative mandates . . . (By the 1980s) the core of the active movement (has become) reformist, but with some strong radical elements remaining . . . (utilizing paid professionals including lawyers and ecologists, and community organizers mobilizing regional or local support) the movement is much more power-oriented than it was even in its early days . . . the adversarial process has generally become one of intensive and extensive negotiation rather than marches and protests (Schnaiberg, 1980, 376-377).

We can posit, then, that as the environmental movement was moving into its reformist phase (with some strong radical elements remaining) the initial incumbents were finishing their university degrees and entering the initial DNR positions (or took positions based in related university, lab technician, company environmental regulation, municipal, or consultant types of clean water regulatory work). What was the character of the "social movement goals" that the initial incumbents took with them into the initial positions as a generational first cohort?

This is a very difficult question. Part of the problem lies in the underdeveloped literature on program professionals. Wilensky, for example, simply stated (1964) that the new, mixed professionals would adopt, as their own, social movement goals, and would carry them in a mix with professional and organizational goals. Given the history of the environmental movement contemporaneously with the graduation and job-seeking of this generational cohort, we can posit that these social movement goals are "reformist" goals. That is the nature of the

legislation creating the initial positions, and ancillary roles. It was these reforms which facilitated the emergence or altering of most of the water quality positions.

However, because the occupational interests of clean water managers may be in carrying out legislated reform mandates does not mean that a complete description of any potential senior worker, first generational cohort can be encompassed within the originating reformist origins effect. We've seen that there were mixed ideologies in the environmental movement - in particular tensions between reformist and radical, but also meliorist dimensions (people oriented rather than institution-oriented norms). Clearly a great deal of work needs to be done with the notion of program professional to sort out such diverse identities. More work on social movement typologies would help.

An additional typology of social movements has been presented by Hannigan (1985) in his review of Touraine, Castells and social movement theory. Hannigan observes that there are four types of social movements: cultural movements, professional reform movements, revolutionary movements, and social liberation movements. These four types of movement were discussed in Chapter 2 in terms of high or low emergent group identity, and high or low emergent anti-institutional awareness. A professional reform movement, the focus of much existing resource mobilization research, lacks both anti-institutional awareness and a sense of distinct identity (as a social movement), according to Hannigan. The other movements vary. For example,

a cultural movement has developed a distinct sense of self-identity but has not adequately connected its goals and actions to a wider critique of the social system (low anti-institutional awareness). A revolutionary movement has recognized the need to reconstitute the existing political order but lacks the distinct cultural base upon which a collective resocialization can be mounted. A social liberation movement (eg., the Warsaw arm of Solidarity) has achieved a high awareness of the meaning of its challenge and has seen its actions in relation to the need to reconstruct societal structures and values as a whole. Furthermore, it has created a distinct, self-conscious cultural identity which contributes to the autonomy of the group and provides a basis for movement solidarity . . . we need to learn more about the conditions which lead to the development of one form of social movement as against another. In particular, what

produces the dual consciousness which characterizes the social liberation movement? (Hannigan, 1985, 449-450).

The environmental movement is complex, containing within its current reformist phase elements of all four movement types outlined by Hannigan. What blend of goals, of movement identity (Schnaiberg) or movement types (Hannigan), do the senior worker, generational first cohort carry? In our survey we simply asked about "commitment to environmental goals." And we asked, very simply, for them to "rank" environmental movement, organizational, and professional orientations in terms of commitment or importance to them. Our results showed the senior worker generational first cohort responding about evenly between the three alternatives. In a ranking of "1" for highest and "3" for lowest, the first cohort tended to rank professional goals as first, organizational goals as second, with environmental goals third, although the number of respondents (N = 20) is too small to make this a reliable measure. This result is shown in Table 2, below. While survey results are inadequate, nevertheless, information from the intensive interviews suggests that while professional goals may be paramount, as would be expected with an middle-aged job cohort, the social movement goals do stand out as important. Our data would tend to support the view that the predominant ideological orientation of contemporary clean water managers appears to be of a "reformist" (Schnaiberg, 1980) and "professional reform movement" (Hannigan, 1985) type. However, this is not what our participant observation and intensive interviews would necessarily conclude without reservation.

It is clear from our study that the initial incumbents have been, in some simple, direct sense, "carrying movement goals as their own" - the Wilensky hypothesis. It can be hypothesized that the initial role incumbents have affected the attributes of the initial positions by carrying environmental movement goals. For example, frequent mention was made by key informants of the difficulty and need to make the "reformist" and "professional reform movement" dimensions of "environmental" activity

effective. Yet additional evidence exists in the interviews, the biographies, the survey attitude measures and the secondary literature that the origins effect of the environmental movement includes these other

Table 2. How mid-Michigan Surface Water Quality Division senior worker generational first cohort (N = 20) rank professional, organizational, and movement commitments.

Commitment	Rank		
	1	2	3
to environmental movement goals	5	6	9
to the DNR as my work organization	5	10	5
to environmental management as a professional career	10	4	6

dimensions: "radical as well as reform", cultural movement, "meliorist", and social liberation movement components. The institutional orientation of clean water managers is "reformist" but the ideological elements of the generational first cohort of clean water managers importantly include additional, more anti-institutional, beliefs, values, and norms. This continuing anti-institutional type of social movement identification, at the ideological level, not fully institutionalized in reformist work roles themselves, may prove to be an important tension. Such anti-institutional orientations may be setting up an interactive effect with the institutionalized component of the work role culture, and may influence the emerging nature of the occupation. It is the generational first cohort, it may be hypothesized, which carries the longest evidence of these tensions. These tensions may have influenced the direction of change in this work role.

There are a wide variety of characteristics of the initial cohort of incumbents of a position that may influence the subsequent development of the role. Consistent with the general theme of this study, we have chosen to emphasize the environmental orientation of the first cohort of water quality managers. This emphasis links cohort origins effects to our next research question. To what extent are occupationalizing steps due to a cohort effect as it is influenced by a continuing social movement? What has been the influence of the social movement on the subsequent development of the position? To this question we now turn.

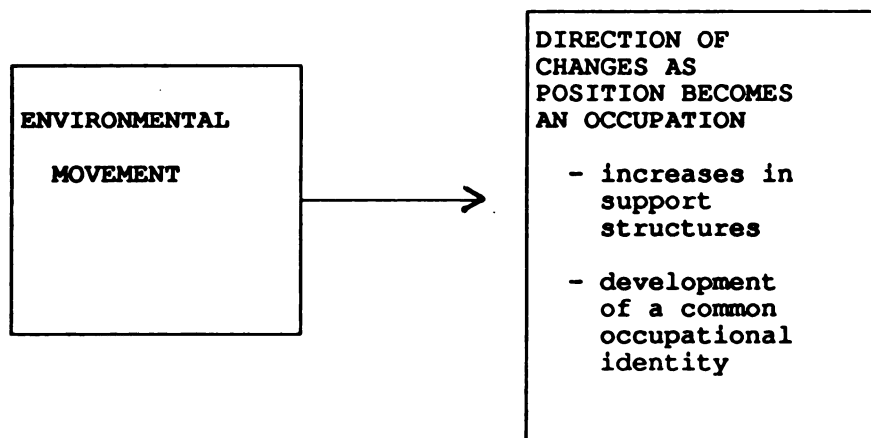
Research Question #6: Were there continuing influences of the environmental movement on subsequent development of the position? (movement effect)

Our expected causal model (Figure 1, p. 22) suggests a continuing influence of the environmental movement on the direction of changes as the position becomes an occupation. A representation of this is indicated in the lines of influence depicted in Figure 9, below.

Changes in the position exemplifying increases in support structures were hypothesized to include: increased autonomy in the authority structure; more formal patterns in training and socialization; and more orderly or standardized career patterns. The other major change expected is increased development of a common occupational identity. How has the environmental movement influenced changes in these occupational dimensions?

During the origins effect period (1965-1977), the environmental movement, taking a "reformist" direction, moved from mobilization and protest to a power phase, pushing for and passing legislation, creating new jobs and altering existing ones, and initiating waves of litigation around the new laws. Once established as new positions in a mandated, complex, emerging organizational field - new positions requiring extensive knowledge - the attributes of the new or altered positions were set in an initial mold which included: limited authority, limited career steps, and limited intrapositional mobility - they were slots in a program. While

Figure 9. Continuing influences of the environmental movement on subsequent developments of the initial position.

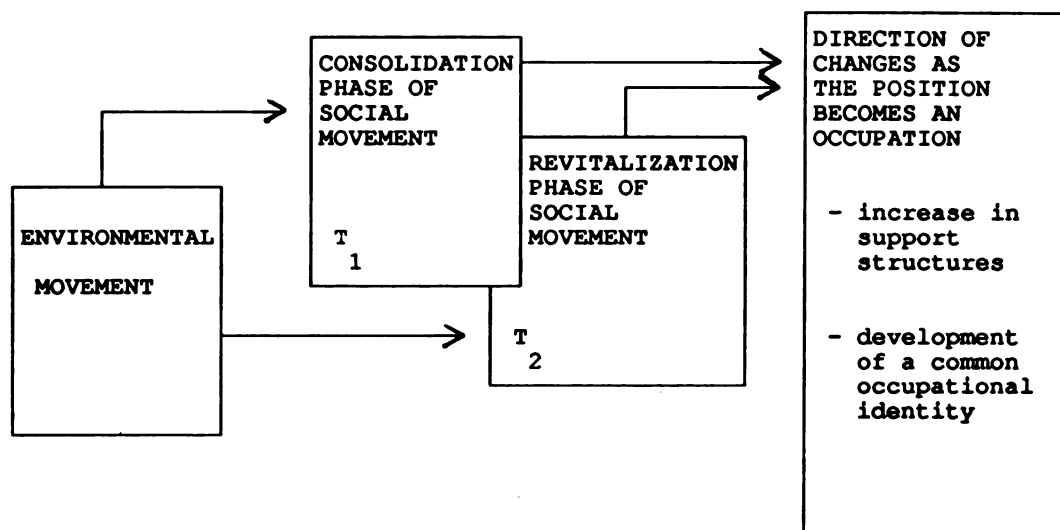


there were many aspects of rapid change affecting the internal development of the position - rapid change in ecological, organizational, and legal/regulatory knowledge, and emerging organizational field contacts (origins effects, knowledge effects, complexity effects) - it is also possible that the position began to change in the direction hypothesized from external influences - primarily the influence of the continuing environmental movement (movement effect).

We have reviewed how the environmental movement, once it had established the initial positions in the regulatory phase of water quality policy (1965-1977), subsequently underwent two transitions within the next few years. First, a consolidating phase within the environmental movement (1970-1980) focused around "reformist" orientations: the movement became busy monitoring the new environmental regulation programs and engaging in litigation to enforce the laws. The level-funding for several years of the wastewater treatment grants program, in particular, established a period in which, from an internal point of view, some stability in the position could be counted upon. Second, the early Reagan administration launched, as part of a mounting industry resistance to regulation generally, a counter-movement that, as we have seen, sparked a revitalization of the environmental movement during the early 1980s (Dunlap & Mertig, 1992). These separate phases of the environmental movement may well have had different influences on the direction of change in the initial positions. This is depicted in the lines of influence in Figure 10, below. What were the influences of this early 1980s revitalization period of the environmental movement, as separate from the consolidation phase, on the direction of change in the clean water manager positions as they became an occupation?

Intensive interviews with key informant senior workers (who were generational first cohort) revealed that, to the extent that they are representative, initial incumbents in the clean water programs were very aware that they were entering a new regulatory phase of the environmental

Figure 10. Influences of the consolidating and the revitalization phases of the environmental movement on subsequent developments of the initial position.



movement. They reported their memories of having to "stand up" to the various parties in the mandated, emerging organizational field. During this period, roughly 1977 to 1980, many intricacies and conflicts in this new role were occurring. One influence of the "reformist" phase of the movement was that, in its origins effect, it had launched these new positions. Now that the initial incumbents were under fire, the consolidating phase of the environmental movement welcomed their monitoring and reports "from the front," which were disseminated and filtered throughout the environmental movement.

A detailed content analysis of environmental movement literature would provide insight on these processes, but is beyond the scope of this study. However, it can be surmised that such reports from the new positions and monitoring of the new positions by the movement were providing knowledge to the environmental movement and to professionals alike about how hard and where to push on the litigation front, and where to lobby for stronger legislative backup. In fact, considerable

interaction between the environmental movement and the new positions was going on. Much of it was filtering through the intermediary and ancillary roles of the new university programs in environmental studies. The dynamic influence of the environmental movement would stimulate the requests for guest lecturers from the new environmental positions. Assigned reading of texts and articles written by people in contact with the initial incumbents enter the curricula. Professional and scientific association meetings and their divisions, and early scientific papers read by initial incumbents at professional meetings - all provided contexts of interaction.

When the counter-movements coalesced sparking the revitalization phase, another set of separate influences occurred. Participant observation during a period of work in the grants unit in 1981 suggested an embattled ambience to the 3-5 year old positions. Now the Reagan administration counter-movement against regulation was aimed at the new environmental regulatory establishment. Papers given at meetings, liaison with university programs, internal informal talk in the unit - contained an undertone of resistance. Each step of the new regulatory establishment was being watched by the anti-regulatory administration in power; each step of the new regulatory establishment was being monitored and encouraged by the environmental movement. The "revitalization" was on. A detailed study of this early 1980s period is, again, beyond the scope of this study. Clearly such studies, in general, would provide needed detail for the effects of counter-movement and revitalization on origins effects in the story of movement-influenced occupational emergence (PISMO processes). The direction of change in the position, during this revitalization period, may be hypothesized to have sensitized persons engaged in building the growing support structures - e.g., university programs, professional associations, occupational associations - to the importance of their work: the embattled environmental front needed those support structures. Every paper delivered, every section meeting, every

university course, colloquia, issue agenda, and consultation may have carried with it a heightened sense of the need to secure and build up the support structures for the new, environmental management positions just recently consolidated.

Historically, of course, academe as a support structure for many kinds of human work has, at times, been influenced by social movements, during periods of political and cultural change (Gouldner, 1965, 1980). It can be hypothesized that, in general, the environmental movement during the early 1980s revitalization phase helped to develop a common occupational identity and to build up support structures. The revitalization phase may have contributed to more orderly careers by emphasizing (eg., as a legitimacy shield) more formal training and socialization and standardized career patterns: the political anti-regulatory counter-movement would have to overcome ever more legitimate professionalization. The role of a "revitalization" phase in the social movement influenced emergence of occupations requires closer study. Dunlap and Mertig (1992) suggest that in the case of the environmental movement this revitalization period was crucial in sustaining much of the impact of the new regulatory environmental establishment. However, the counter-movement of the 1980s was not without its consequences on the position.

Intensive interviews suggested that initial incumbents spent much of the 1980s and early 1990s struggling to protect against the erosion of environmental work. A memo, written in the spring of 1987 by a senior worker, initial incumbent, to section chiefs and unit chiefs in the grants program, suggests some of this concern:

I would like to lobby to get more consideration for our section's reorganization under the loan program.

. . . In the "future program" it is likely that our role in the protection of the environment, especially from construction impacts of proposed WWT projects, will be heightened, because we may be able to obtain delegation of this responsibility . . . currently EPA has the last word by being responsible for the Finding of No Significant Impact (FNSI) which negates the need for a full-fledged EIS (Environmental Impact Statement). Under the loan program, it is likely that this will not be the case and we will have full responsibility for the environmental impacts of a project.

This program is an environmental program, not a community development program. It would be a shame if an environmental organization such as the DNR had no distinctly designated environmental specialists in a loan program responsible for millions of dollars worth of WWT works construction! Therefore, I suggest that in the future section structure, we have environmental review and document preparation as separate staff functions from that of loan specialist/officer/technician.

Memo's like these suggest the continuing influence of environmental goals in the concerns over the subsequent development of the position.

The influence of the environmental movement, however, did not end with the "origins effect" but was continuing during this period (1980s) in a revitalization and resistance phase. Another quote from the intensive interviews with initial incumbents indicates the first cohort's long-term vision of what the environmental movement is asking of the new occupations:

In our own time we want to establish coherence between human society and ecology. We are a 'coherence generation.' The environmental movement is asking for coherent solutions to how things are done so the environment is not polluted. We need to 'design with nature'.

In this quote the senior worker was using a phrase from the title of a late 1960s book, and the interviewee then showed the interviewer the book Designing with Nature, by Ian McHaig. Is this continuing influence of the environmental movement felt widely among surface water division workers in mid-Michigan?

Survey questionnaire results from first cohort responses to the question "What made you decide to apply for this work" included the following responses:

- Environmental/ecology interest
- Interest in water quality assessment field
- Education, experience and interest in water pollution control
- My desire to work in the environmental field
- Interest in water pollution control
- I chose to work as an environmental professional
- Interest in the field of environmental protection
- Interesting work, work outdoors

- Challenging

- It was what I went to school for, always have loved aquatic systems

These orientations are not always facilitated by the occupational and organizational structures of DNR and civil service. One behavioral influence of the environmental movement has been to try to free up "coherence" and focus from the required, routine behavior in the role.

Several key informants argue that there is too much paperwork, not enough time to "be environmental": to read scientific papers, to speak at high school and college classes, to have brown bags or seminars on environmental topics. These views seem widely shared and indicate the continuing influence of environmental goals as well as the problem of build-up of bureaucratic paperwork in the development of the position.

In our discussions of research question #4 (How did the initial definition of the position affect subsequent developments of it?) we noted origins effects of the initial definition of the position that led to subsequent developments of more and more paperwork. We reported survey data for the first job cohort showing 72% agreed that somewhat or a very large increase in paperwork has been a way in which the water quality job has changed. If we take all sample respondents, the percentage is the same - 72% find an increase in paperwork.

For the entire sample answers to the question, "What other kinds of changes do you perceive in the nature of your water quality job(s) over recent years?" we get responses that indicate a continuing influence of the environmental movement, in an attitudinal sense. Some of these responses and their frequency are shown in Table 3, below.

Because several of the attitudinal responses were difficult to code the actual responses are reproduced (in the groupings, eg., attitude statements) in List 3 and 4 shown below.

Table 3. Type and frequency of social movement and other effects in the responses of mid-Michigan Surface Water Quality Division workers to the question of what changes they have seen in the nature of their water quality jobs over recent years.

Attitude Statement	Frequency
Social movement effect	9
Knowledge effect (ecology, legal/regulatory, or technical/engineering)	6
Political or bureaucratic effect	6
Complexity effect	2
No change	2

These lists of changes in the job suggest several dimensions of potential social movement influence on the direction of change in the job. The reports of increased public involvement and public knowledge suggests the direct continuing influence of the environmental movement to get their message across in the public arena: environmental consciousness has increased. The critical views of politics, paperwork, legalism ("professionalism = regulation"), development, growth and politics suggests the indirect continuing influence that the environmental movement has on role incumbent attitudes to keep subsequent developments in the position "environmental". The reports of developments in the position in terms of more knowledge requirements, and also the increasing emphasis on cleanups and toxics and the concern about impediments to good science can be interpreted not only in an imminent sense as growth of knowledge, but may also be indirectly a sign of the continuing influence of the environmental movement: becoming expert, or "having to become expert in more and more fields" indicates the environmental movement goal of coherence may be increasing in a period of growing cross-media environmental management.

List 3. Actual responses of mid-Michigan Surface Water Quality Division water quality workers to the question "What other kinds of changes do you perceive in the nature of your water quality related job(s) over recent years?"

- Much more effect to include and interact with the public
 - Computer training and knowledge is expected
 - Increased emphasis on cleanups and toxic chemicals
 - Doing bureaucracy and PR is more important than doing good science
 - The more "professional" your job(s) become, the more "regulation" is involved
 - Away from specifics, i.e., end of the pipe to larger basin-wide effects - nonpoint source - hydrologic changes; sedimentation less toxics
 - more political control in environmental decision-making process
 - I have to be an expert in more areas every year
 - Much more public awareness and interest. Some frustration in the increased amount of paperwork and decreased amount of fieldwork
 - Increase in identification of impacted areas from nonpoint source pollution (agricultural, urban). Remedial Action Plans are a big waste of time
 - More environmental awareness/concern
 - more and more of the decisions are politically based rather than technically based
 - Not much change. Also changes in the program depend on the changes in the environmental laws
 - None - the water quality field seems more stable than some other environmental fields
 - Public is more educated so questions are more specific and technical
 - The need for public information is greater now than it has been in previous years
 - Much more regulatory in nature and involved with attorneys more than engineers
 - The change in political climate in Michigan may have a direct impact on the direction of water quality programs in near future (negative impact)
 - An ever increasing number of everchanging state and federal regulatory mandates
 - More public input, more legal oversight, more environmental accountability
 - Focus of annual activities changes with source of funding monies. Also has changed as the degree/perception of environmental hazards have changed
 - Much more public involvement required
 - Departmental/division priorities driven more by external stimuli: political influence greater; chasing federal grant money or responding to federal requirements is a primary influence on resource allocation and policy
 - We are not protecting the environment, we are promoting growth and development
 - Things are more complex
-

This list of responses about changes perceived was then coded into categories of social movement, knowledge, political or bureaucratic, and complexity types of change, as shown in List 3. Some of the coding was difficult. For instance was "more public awareness," and "more public input," etc. a sign of social movement effect on the job or alternatively the usual type of political awareness and input typical of many governmental activities? We coded increases in public awareness and input as a social movement effect. Our assumption in this coding is that much (if not all) of the increase in public awareness and input has been a consequence of the influence of the continuing environmental movement and does not represent "politics as usual."

List 4. The list of attitude responses to the question "What other changes have you perceived . . ." as coded into social movement, knowledge, political or bureaucratic, or complexity effects (see Table 3, above).

Social movement effect

- much more effect to include and interact with the public
- much more public awareness and interest. Some frustration in the increased amount of paperwork and decreased amount of fieldwork
- more environmental awareness/concern
- public is more educated so questions are more specific and technical
- the need for public information is greater now than it has been in previous years
- much more regulatory in nature and involved with attorneys more than engineers
- more public input, more legal oversight, more environmental accountability
- focus of annual activities changes with source of funding monies. Also has changed as the degree/perception of environmental hazards have changed
- much more public involvement required

Knowledge effect

- computer training and knowledge is expected
- increased emphasis on cleanups and toxic chemicals
- the more "professional" your job(s) become, the more "regulation" is involved
- away from specifics, i.e., end of the pipe to larger basin-wide effects - nonpoint source - hydrologic changes; sedimentation less toxics

List 4 (cont'd).

- increase in identification of impacted areas from nonpoint source pollution (agricultural, urban). Remedial Action Plans are a big waste of time
- an ever increasing number of everchanging state and federal regulatory mandates

Political or Bureaucratic effect

- doing bureaucracy and PR is more important than doing good science
- more political control in environmental decision-making process
- more and more of the decisions are politically based rather than technically based
- the change in political climate in Michigan may have a direct impact on the direction of water quality programs in near future (negative impact)
- departmental/division priorities driven more by external stimuli: political influence greater; chasing federal grant money or responding to federal requirements is a primary influence on resource allocation and policy
- we are not protecting the environment, we are promoting growth and development

Complexity effect

- I have to be an expert in more areas every year
- things are more complex

No change

- not much change. Also changes in the program depend on changes the environmental laws
- none - the water quality field seems more stable than some other environmental fields

If the environmental movement were having a continuing influence on the position we would expect role incumbents to associate with environmental organizations. The survey results for the question "Which issue-oriented environmental organizations or associations are you now in or in the past have been a member" reveals a majority of all respondents (30 out of 49) having one or more affiliations. However, we also get a surprising number (17 out of 49) with no affiliation at all, and, put another way, 27 out of 49 with only one or no affiliations. Is the number of affiliations low or high? How should we interpret this finding?

Intensive interviews brought out that many water quality managers feel that the conditions of their civil service, the pressure in a legal-rational position to be neutral, prevent them from overt affiliation with environmental movement organizations. Several mentioned the Hatch Act, prohibiting formal political activity on the part of civil servants - and many mentioned their need to play a neutral, even-handed, fair regulatory role as reasons to avoid issue-oriented associations. For example, one survey respondent commented about joining issue-oriented associations: "It would be a conflict of interest." Given these attitude data it may, then, seem more surprising that 20 out of 49 have two or more affiliations with issue-oriented environmental organizations or associations. The list of affiliations and the number of respondents affiliated with them is given in List 4, below. Fourteen people had three or more affiliations. Given

List 5. Frequency of affiliation with issue-oriented environmental organizations or associations by mid-Michigan Surface Water Quality Division water quality workers.

<u>Organization</u>	<u>Number of Respondents</u>	
	<u>Now</u>	<u>Past</u>
The Nature Conservancy	7	3
Mich. Utd. Cons. Clbs (MUCC)	3	4
Ntl Wildlife Fed	3	4
Audobon Society	3	1
Ducks Unlimited	2	1
American Fish Society	2	-
Mich. Chapter	1	-
Sierra Club	1	-
Wildlife Society	1	-
World Wildlife	1	-
Ecology Center Ann Arbor	1	-
Water Env. Fed (WPCF section)	1	-
Huron River Watershed Cons.	1	-
Soil & Water Cons. Soc.	1	-
PETA	1	-
Wilderness Society	1	-
Defenders of Wildlife	1	-
Greenpeace	-	2
Cousteau Society	-	1

the strictures on conflict of interest, the civil service work context, laws such as the Hatch Act, and real political appointees at departmental levels in every state civil service, the pressures not to overtly affiliate are strong. Therefore it may be a sign of the continuing influence of the environmental movement (and a sign of its strength) that despite these strictures and civil service work conditions, the pattern of affiliation with issue-oriented associations is as strong as it is.

On the other hand, it appears that the more highly politicized environmental organizations, such as the Sierra Club and the Environmental Defense Association, which do a lot of litigation, and associations such as Greenpeace, that engage in direct action and civil disobedience, are not among those organizations most affiliated with. Instead the more conventional organizations, such as the Nature Conservancy, are popular. Still, the Michigan United Conservation Clubs (MUCC) takes on many issues at the state level as a local organization, and several have now or have had memberships in it. In one of the intensive interviews the informant speculated that he "might join MUCC". This was mentioned in the context of discussing the needs for neutrality and evenhandedness in regulatory work - so feelings of insurgency or desire to affiliate with action-oriented environmental associations may be present in many environmental managers, and indicate a potential for continuing influence of the environmental movement on the subsequent developments in the positions.

Our overall question is to ask what the influence and conditions are for the emergence of an occupation. While we have traced the emergence and initial definitions of the clean water manager role, we want to focus on the specific processes that "occupationalize" the role. To this story we now turn.

STEP THREE: OCCUPATIONALIZING THE POSITION

The nature of the process of occupationalizing includes various pressures for greater autonomy in the authority structure, more formal

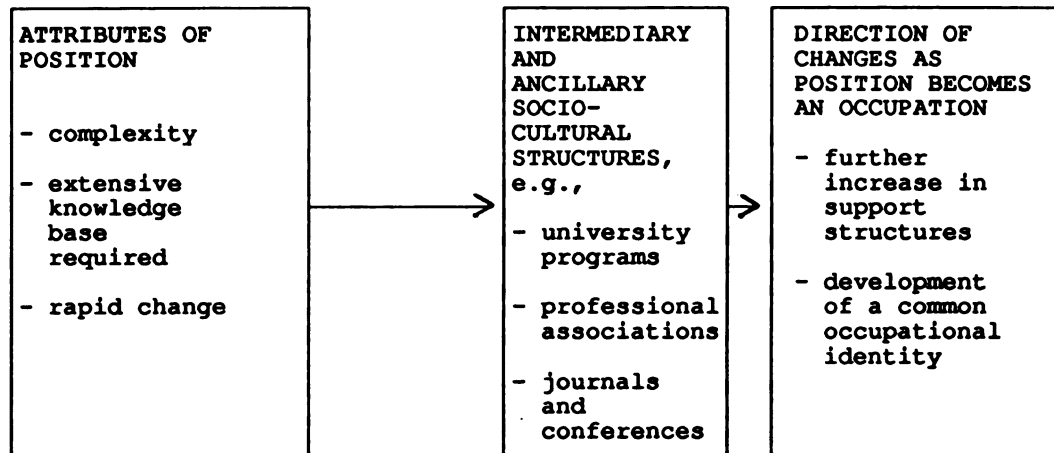
patterns of training and socialization, and more standardization (or orderliness) to career paths. In general, these goals are accomplished through increases in support structures and a common identity. Occupationalizing is the set of processes, then, through which the development of these support structures and shared occupational identity emerges.

Abbott (1988), defines patterns of autonomy, formal training and socialization, standardized career paths, and support structures from a sociological perspective as routine patterns of behavior (or social structure). He defines cultural patterns of common occupational identity (or group consciousness) as adding meaningfulness to such social structure. Occupationalizing, from this sociological perspective, is the process of building up routine patterns of behavior and meaningful group consciousness around a labor market position. Such emergent social structure and group consciousness then has interactive, additive, multiplicative and/or dialectical aspects which, in an amplifying loop, may lead to further, often unique, and historically different, processes of ongoing occupationalization that may be specific for each emergent occupation. For example, what is the specific history of the build-up of structural supports for the clean water managers as their positions develop into occupations?

Research Question #7: What structural supports for the position have developed?

So far we have identified several influences on the direction of Changes as the position becomes an occupation, as depicted in Figure 11. In this figure (and in our presentation) we have indicated influences on the direction of change to include both the consolidation and the revitalization phases of the environmental movement, the attributes of the initial position as an origins effect, the influence of a generational first cohort and a later occurring first job cohort, all of which are now shown as filtering through a building up of intermediary and ancillary

Figure 11. The occupationalizing of the emergent position through build up of support structures.



socio-cultural structures, e.g., university programs and professional associations. Given these, (and other), general influences, what can our study say about the build up of social structural supports?

Support structures figure prominently in the literature on occupations and professionalization as part of the build-up of routine patterns of activity around a labor market position. In the case of environmental management such support structures have emerged through the combination of influences of 1) the environmental movement, 2) origins in legislation, 3) attributes of initial positions, and 4) attributes of initial and subsequent role incumbents, as described. What structural supports have been developed from these influences? We might hypothesize that build up of social structural supports for the emerging water quality positions would include: professional associations and their divisions and publications, on and off the job training programs, increasingly specific career paths, and autonomy-developing authority structures such as

procedures for expert witness, environmental impact statements, and other legal/regulatory expectations.

As mentioned, Abbott summed up the occupationalizing effect by noting that in order for an occupation to emerge there has to be a build up of social structure around the job and a build up and increase in group self-consciousness. We gave some general examples of this in our review in Chapter 2 of several social movement institutionalized occupations (adult education movement, labor movement, mental health movement, etc.). In any specific case it would be necessary to detail the historical context and focus on some of the methodological considerations (measures) such as organizational commitment, calling or sense of mission, peer evaluation, occupational autonomy and social value of job to help measure or determine when a type of work has become an occupation. We reviewed the career literature, the professionalization literature, several of the empirical studies of occupational emergence, the social problems literature, and new class theory. We also asked about the role of social movements in a search for the processes, conditions, and contexts related to the kind of build up of social structure and group consciousness that transforms a job into an occupation. What has our detailed history of the clean water managers revealed for us about how this occupational effect works in the field of environmental management?

First of all, what's new about environmental management occupations? Schnaiberg (1980) observed that there have been three historical types of nature-oriented American movements: the earlier and continuing preservationist movement, the earlier and continuing conservation-efficiency movement, and the more recent (regulatory and ecological) environmental movement. Earlier nature-oriented movements in America enhanced certain jobs and occupations - for example, the establishment of forest service jobs and national park jobs. Schnaiberg reviewed the differences in this regard between the earlier movements and the current environmental movement. The turn of the century (early 1900)

preservationist movement did not require many occupations to accomplish its ends. However, the expertise dimension of the conservationist-efficiency movement did require the type of work that typically is an occupation. Yet occupational requirements of the conservation-efficiency movement also contrasts with the occupational requirements of the environment movement. The effectiveness of the conservationist-efficiency movement:

. . . is enhanced by the central role of scientists and technologists. The conservationist-efficiency movement relied on technological and scientific expertise in sustained-yield forestry (silviculture), fisheries, and other agrarian extractive industries. A key role was played by applied production scientists, whose concern was less with total ecosystem functioning than with the efficiency and sustained yield in limited ecosystems . . .

In contrast, the environmental movement was influenced far more by impact sciences, however scattered and imperfect they were and remain . . . The questions of efficiency and effectiveness of any given form of regulation - whether prohibitory or by fiscal incentive - expands the role of both impact and production scientists, and especially technologists (Schnaiberg, 1980, 386-387).

Formed by both prohibitory measures (NEPA permit standards) and fiscal incentives (federal funding increasing from 30% incentive in 1956 to 75% incentive by 1977), the DNR community assistance (municipal facilities) grants section jobs, for example, were influenced by impact sciences (EIS) as well as production (WWTP operations), construction (WWTP design, remodeling and building), and technical (water quality) knowledge. The DNR Surface Water Division generally has many impact technologists and scientist or semi-scientist roles. Schnaiberg (1980) reports that the environmental movement has been strained

. . . by such new burdens of responsibility for altering production. Part of this burden has been reduced by increased employment of impact scientists and technologists in the state, especially in the Environmental Protection Agency, the new Department of Energy, and the Department of Interior. Additionally, older production-oriented agencies have somewhat increased their employment of impact technologists and scientists as part of the requirements of NEPA and the environmental impact report process. (Employment was also generated by pollution abatement industries and those focusing on new energy technologies).

Interestingly, the preservationist movement had far lower scientific and technological requirements. Although writings of impact-oriented ecologists, wildlife experts, fish and game administrators, and the like were influential, they were not

critical for mobilizing local constituencies for preservation of land or water areas (Schnaiberg, 1980, 387-388).

Strained by the need for impact technologists and scientists required for the more sophisticated ecological knowledge required to carry out the EIS and the more detailed prohibitory regulations required, the environmental movement needed laws creating and expanding the role of such impact science positions and also more sophisticated roles within the movement. This has contributed to a higher degree of institutionalization. That is, these developments required the build up of more support structures. Schnaiberg reported on this in 1980:

. . . At this point all of these movements had been institutionalized to some degree. Conservation-efficiency concerns reside within corporations and state agencies, preservationist concerns in local and especially national organizations. And the mass base of the environmental movement has been transformed into a supportive public interacting with an increasingly bureaucratized movement structure.

. . . With the partial exception of the nuclear power controversies, the social protest action now takes place in Congressional hearings, regulatory commission hearings and reports, environmental impact meetings, and in legislative lobbying and formal litigation (Schnaiberg, 1980, 38).

The most important support structure, then, has been the mass base of the environmental movement of the late 1960s and early 1970s becoming "transformed into a supportive public interacting with an increasingly bureaucratized movement structure." This movement structure has become bureaucratized in both the sense of becoming partially institutionalized (PISMO processes) into those EPA and state agency labor market positions, with their feedback into professionalizing movement headquarters, and in the sense of the social movement organizations (SMOs) themselves becoming more bureaucratized. The public, at this time, becomes supportive and interacting with both types of the increasingly bureaucratized movement: labor market environmental management positions and the increasingly Professionalized movement organizations. Schnaiberg laments, however, that "this institutionalization occurred prior to the expansion of the social base of the movement. Without the infusion of broader labor and social equity participation, it appears that the movement is more subject to

cooptation. . ." (Schnaiberg and Gould, 1992). McCloskey, a former Sierra Club director, also recently muses about whether the professionalized national structure of social movement organizations as bureaucratized structures, can deliver on their promises to their supportive mass base of subscribers and members.

In any case, these contemporary drawbacks of the way the environmental movement institutionalized in the late 1970s may not have been as evident to the direct participants at the time. What was evident, at the time, was that the momentum of institutionalizing stringent regulatory laws required strong backup with rapid initiation of additional supporting structures to express the mass based desire to "nail down" an environmental agenda. Part of this build up of additional supporting structures took place at the universities of the land.

Environmental Movement Initiates University Programs

During the transition in the environmental movement from loosely mobilized direct protests to some degree of institutionalization, pressures were placed on universities through lobbying, legislative pressure, agency suggestions, direct student and faculty pressure, and from other sources, for example, the general media-ization of the environmental problems and the social problem process, to develop courses, majors and programs that would reflect both movement themes and also prepare for the expanded roles of impact technologists and scientists in the new labor market positions. Pressures from the movement focused on starting up general, interdisciplinary schools, institutes and programs. The movement was to shift emphasis in the universities from conservation, e.g., of one resource with a school for that resource, e.g., Forestry, to an interdisciplinary approach that treated environmental problems as the interaction of sets (environmental, technological, economic, and sociopolitical) - areas of study that are often treated in isolation in other academic units (Christiansen, in Disinger & Schoenfeld, 1987, 201). On the other hand the new roles in state agencies also needed specific

types of generalists and hard science preparations - both a growing need for specific specialists such as stream ecologists, biologists, chemists, fisheries scientists, and a need for interdisciplinary generalists such as those trained in resource development, environmental engineering, geography, urban planners, and ecology studies.

Interviews with university resource development departments suggest that, as occupational support structures, degrees in "resource development" and similar generalist programs hold mixed results in terms of distinct career paths. One major university professor of Resource Development commented that placement in distinct career slots is still problematic in the 1990s for such majors because of the vague career lines in the environmental regulation labor market generally, and because of the vagueness of many of the program degree labels (Dersch, 1990). This suggests that other influences besides the environmental movement, are important for the nature of the build up of support structures - for example, the complexity of the work.

There is a major, continuing need, for data as a result of the complexity of the water resources problem, especially for data related to water quality. A considerable effort is being directed now at technology transfer, that is, the difficult task of getting the technical information from the hard scientist to the decision-makers, as well as to the public.

Insofar as water supply and maintenance (or restoration) of water quality is a long-term operation - and is dependent upon predictions and forecasts of populations, water and energy demands, and technological conditions - the continuing need for an improved data base is evident. That research need requires major, continuing, research efforts. This type of academic based worry (Dersch, 1990b) is reflected also in the on-the-job worries which are revealed in our intensive interviews. Several key informants remarked in interviews:

We should be doing less bureaucratic paperwork and more reading of research articles.

Similar comments have been reported by MDNR Surface Water Division survey respondents.

The research activity is a structural support. If a work role does not have the "complexity", or "research" and "transfer", pressures, then there is less social-facilitation for development of support structures needed for occupationalizing. But, it is precisely the growth of knowledge in the water quality (and more generally environmental management) field(s) - the growth of ecological consciousness - which links with other facets of pressure for building support structures: social movement effects, origins effects, cohort effects, and organizational learning. How does this imminent effect (knowledge and complexity) relate to the other facets of pressure for building support structures?

One answer to this question is to note the sheer complexity of organizations within the research and inventory-of-resources field of water quality. The Environmental Protection Agency itself has 15 national laboratories. At present, research into water and water-related land resources is (or has been) performed by the Agricultural Research Service (ARS) (soil and water conservation), the National Weather Service (meteorological data), the Office of Water Research and Technology (abolished 1982), and the National Oceanic and Atmospheric Administration. Coordination and study agencies include (or included): the Water Resources Council (abolished 1981), the National Water Commission (which did a 5 year study during the period 1968-1973 and "pointed the way"), and the Council on Environmental Quality (abolished 1982). Other existing agencies include: Forest Service, NASA, Geological Survey, and the TVA. Water resources research is also being conducted at numerous biological, economic, engineering, geological, legal, natural resources, and political science departments of colleges and universities (some of which are under the auspices of, and in cooperation with, the many agencies listed). And, of course, there is considerable ongoing research by departments, sections

and units of the various 50 individual state water quality agencies, commissions, and councils.

One way to follow the complexity of this emerging occupation is to review the history of the occupation in the proceedings of the American Society of Civil Engineering (ASCE). The ASCE had a division (section or interest group) called Sanitary Engineering (SED). We will examine the occupational history of clean water managers through a review of this divisions' professional journal. But, first, we need to return to some recent contributions of occupational sociology to help us answer this question.

Where do the contemporary clean water management work roles - the impact technologists, lab/science and project manager roles, the various water quality specialist positions - come from when the movement shifts from preservationist and conservation-efficiency to environmental regulation? In general they come from the "push" of the environmental movement. It is true that there are internal developments within water science - imminent developments - and that there are also various internal "movements", e.g., the moves away from pure engineering toward biology and interdisciplinary studies in the wastewater treatment field. But the record would appear to favor the overall impact of the environmental movement of the late 1960s and early 1970s as most important. Yet, while Abbott (and others, e.g., Bucher, 1961) documented the internal "movements" and work jurisdiction competitions, this question of external social movement influence on the emergence of the structural supports for an occupation was not elaborated by Abbott in his influential book on the system of professions (1988). Can we study the external influences on an emerging occupation with the same methods as the bulk of the literature has studied the internal occupational developments?

Abbott has recently (1991) put forward methods for understanding the ordering of structural support events in the emergence of occupations and Professions. Beginning with Wilensky's set of steps (1964) on the

structural support elements typical in how a profession emerges, Abbott presents a "formal colligation" of professionalization for the case of American medicine. He notes:

A sequence analysis follows (a) design . . . It begins by conceptualizing a set of hypothetical events, a task I follow the historians in calling "colligation." These events reflect narrative forces that are the true matters of interest, forces that give the events a coherent narrative order. Having once conceptualized the events and the driving forces, we can then propose occurrences that indicate them. Thus for each of the proposed "events" of professionalization, we consider the event itself (analogous to a conceptual-level variable), the narrative forces producing it (analogous to causal arrows between conceptual variables), and the indicating occurrences for dating it (analogous to actual measures of variables) (Abbott, 1991, 361).

He then presents local, state and national level data for the steps in the professionalization of American medicine. These steps are basically: association formed, control of work events, education, knowledge (e.g., various journals enduring over short or longer periods of time), committed individuals, transformation of schools, transformation of libraries, state and national journals, popularization, and dominated work sites. In general his model emphasizes the complexity of relations between the layers of professionalization (local, state and national) and his conclusions emphasize that the process does have a certain regularity. In general, at the state and local level, the sequence of events is: 1) control (e.g., an association), 2) practical knowledge (knowledge and education) which may involve an association, 3) dominated work sites, and 4) scientific transformation of knowledge. The interactive dynamics of both the sequence of events and the local, state and national levels in the process of professionalization are emphasized by Abbott, who notes:

. . . At a very early point in its history, a given area has one or more developing professional localities. As these reach a certain size and importance, they become increasingly subject to general trends diffusing across the country, that is, across all then-operative professional localities. These local developments parallel, then empower a state-level development of professional institutions. A similar relation binds the state and national levels. Early state developments parallel, then empower national development, which in turn triggers rapid diffusion of state-level institutions to those states without them. This in turn further drives the intrastate diffusion of local medical institutions. My most important conclusion is therefore that the professionalization process, if it is to be seen at all in changing professions, be

recognized as the multilevel, contagious, complex social process that it actually is. Professionalization is not a simple collective action by a cohesive group, and we cannot discuss it as if it were (Abbott, 1991, 380).

To completely comprehend the evolution of impact technologists, water quality specialists and other new, emerging and/or altered clean water manager roles would require better sequence data of actual occurrences than this case study has been able to assemble. However, we have asked ourselves the questions that Abbott has asked regarding when certain professionalizing events occurred and what the changing content was of various associations, association divisions, journals, conferences, certification events, and so forth. We have enough of the elementals of the kind of analysis he calls for, in sufficient detail, to venture some conclusions.

We begin the narrative with a historical examination of the occupationalizing events revealed in a library retrieval of the Proceedings of the American Society of Civil Engineers - Sanitary Engineering Division Journal, hereinafter referred to as the SED Journal. This journal has a long history paralleling the urbanization of the United States. Early copies appear to date the initiation of the sanitary engineering division of the Society of Civil Engineers somewhere prior to the 1920s. We wish to begin our analysis of the shift from "engineering" orientations (that paralleled the earlier preservationist and conservation-efficiency phases of nature-oriented movements in the U.S.) to "ecological" or environmental regulation orientations. To do this historical examination we read each bi-monthly SED Journal from February 1956 to October of 1972. It was announced in the October, 1972 SED Journal that an internal division committee had approved a change in name of the division itself from Sanitary Engineering Division to the Environmental Engineering Division, and along with this name change came a change in the name of the journal to The Environmental Engineering Journal, starting with the February, 1973 issue (SED Journal, Feb. 1972, iii). On theoretical grounds, therefore, we would hypothesize that one social

structural support for the newer "environmental" role of clean water managers in the wastewater treatment field had been founded or established as an event with the factual occurrence of this name change as of late 1972. However, what led up to this alteration in a major division of the American Society of Civil Engineers?

Wastewater treatment plants and the engineering surrounding them have been around since the turn of the century. However, again on theoretical grounds it is important to note the relative lack of structural support for this occupation in the earlier years. For example, while there had been a long history from the 1920s on of looseleaf, occasional papers on sanitary engineering bound yearly in libraries, there was not a special division bimonthly bound publication of the American Society of Civil Engineers devoted to sanitary engineering issued on a regular basis until 1956. It was in that year that the federal government first began the 30% incentive grants for improved (primary and some secondary) municipal wastewater facilities design and construction. We are looking, then, at a two-stage event history: from pre-social structural support (no regular division publication) to a division in the ASCE with a bimonthly, bound SED journal from 1956-1972 to a second transition changing the name of the division Journal to The Environmental Engineering Journal (1972-current). Of course, it was in the year 1972 that the Clean Water Act was passed mandating yet another, this time massive, federal wastewater treatment program upping the federal share of costs to 75% and mandating stringent water quality standards, a (1969) NEPA permitting process, and comprehensive planning. How were these changes from "engineering" to "environmental" orientations reflected in the history of this ASCE division from 1956 to 1972? What role did federal programs play in these transitions? What role did imminent (science and academic based) developments in the wastewater field play? What role did the emerging environmental movement play as an external influence on the wastewater treatment field? What can we learn about the processes of build up of

structural supports in an emerging occupation (or "profession in process")?

We begin our review of the narrative events with a 1956 decision to change the publication plans of the Sanitary Engineering Division. Prior to February, 1956, this division had issued looseleaf "separates" or occasional newsletters, without a regular publication schedule. In April of 1956 the division began regular, bi-monthly publication of a bound journal - the SED Journal (SED, 1956-9, Vol 82, 1956). There were encouragements to make it a good technical journal, and a call for papers. The mission statement of the Sanitary Engineering Division reads as follows:

Purpose: to advance scientific knowledge and promote sound engineering thought and practice in the solution of problems of environmental sanitation, notably in the provision of safe, palatable, and ample public water supplies; the proper disposal of sewage, refuse, and other community wastes; the adequate drainage of urban and rural areas for proper sanitation and the control of water, soil and atmospheric pollution. It is the further aim of the division to be well informed concerning the newer engineering problems in the field of public health such as control of insect-borne diseases, the elimination of industrial health hazards, and the provision of adequate sanitation in urban, rural, and recreational areas (SED Journal, 1956-5, Vol 82, SA 1).

As the federal program (for 30% incentive grants) was being formulated in the previous fall, the American Sanitary Engineering Inter-Society Board was incorporated for the purpose of certifying specialists in the various separate fields of sanitary engineering. As part of this process exams were proposed following very closely that used by the various American specialty boards in medicine, veterinary medicine, and nutrition. Additionally,

The certification program will offer a definitely outlined plan for career progression to be a universally recognized method of recognition. In addition to having influence on educational patterns for engineers engaging in the life science area, if the experience in the medical area is any indication, it will certainly influence career patterns within the various agencies. It provides a means of identifying special competence beyond that indicated by academic degree so that individual skills will be better appreciated and utilized. It should tend to raise the stature of all engineers, both those who are certified and those who are working toward such certification (SED Journal, 1956-5, Vol. 82, SA 1, 10-12).

The SED division journal reported in 1956 matters such as testimony of members before federal committee hearings on new legislation (where the problems of inadequate wastewater treatment plants were rehearsed), and sponsored a subcommittee which reported progress on a 20-chapter manual on the practice of sewage treatment plant design. Water was viewed during this period as a fixed resource with increasingly heavy use. This "resource" view of water fit in with the development and coordination phases of US water policy and reflected also the conservationist-efficiency phase of the environmental movement. While water pollution control, and "industrial hygiene" was important to the field, the "engineering" problems of wastewater treatment plant design predominated over "environmental" problems in a regulatory sense. Moreover, the general "professional status" of engineers in general and sanitary engineers in particular was a topic of some discussion. The SED Journal carried numerous articles discussing this theme. For example,

Contemporary engineering journals have carried a seemingly endless series of articles dealing with the professional status of engineers . . . we realize that the relationship between engineer and client and the nature of engineering services are so utterly different from those encountered in the practice of law and medicine that we must concentrate our efforts on our own ground...

The engineer, by and large, lacks those feelings of enthusiasm, devotion, and jealous regard for the honor of his profession that must be developed to a high degree if engineering is to be considered a profession, rather than an applied technology.

. . . Another factor which would have significant, long-term effects upon engineering prestige is that of increased extra-professional activity by engineers in the management of our schools, municipal affairs, and in assuring good government at all levels. If physicians and lawyers have the time for extra-professional activities in local affairs, engineers have little excuse for not making a better showing.

Surely, an all-out effort to improve the professional attitude and esprit de corps of engineers, a stronger program to utilize the energy and talent of younger engineers within Society activities, and the encouragement of public service by engineers would have a profound influence upon the degree of prestige which we enjoy (David H. Howell, "Our Professional Prestige," SED Journal, 1956-19-3, Vol 82, SA 4, October).

In the June, 1956 issue of Vol. 82, the SED Journal included a "Progress Report of the Committee of the SED on Sewerage and Sewage Treatment." Along with discussions of advances in sewer design, construction and maintenance, protective linings, and sewage pumping plants, the report

indicated that there had been a change in the characteristics of sewage in the preceding five years:

. . . This has been occasioned by the substantial use of kitchen garbage grinders in some areas and the increase in the wastage of water from airconditioning systems in others. Experience in Los Angeles County shows that kitchen garbage grinders will about double the grease load in sewers and will create minor problems in the pumping and treating of sewerage-garbage mixtures. Such problems do not suggest a need for curtailing garbage disposer installations, but do indicate need for modifying the design and operation of certain (WWTP and drain) facilities . . . (SED Journal, June, 1956, Vol. 82, SA 3, 1013-9).

In the quote above concerned with "professional prestige" the observation was made that the 1950s sanitary engineers are regarded (and regard themselves) primarily as "applied technologists." The quote in the progress report that follows emphasizes the tendency in the applied engineering orientation to take garbage-disposal grease as a design problem with an engineering solution. This is in contrast to the regulation phase of US water policy where the orientation of the environmental movement tends toward removing pollutants and altering production. The shift to impact science begins to replace the applied technologist orientations.

What does this type of shift of emphasis mean for occupationalizing? For "professional status?" Let us return to the discussions made during the 1950s among the sanitary engineers. For example:

One of the most important aspects of professional development of an engineer is recognition of his professional competence by other engineers. . .

Lack of recognition is one of the most frustrating factors facing the junior engineer. Not only is the junior engineer in the field of Sanitary Engineering considerably underpaid in relationship to the junior engineers in almost every other branch of engineering, but he also fails to receive proper recognition from his employer . . . For the most part, the employer is a professional engineer who has already received recognition at a local level, a state level and usually at a national level . . .

For the most part recognition of one's engineering achievements comes through publication of the results of a particular project. The widespread distribution of the many technical journals in the Sanitary Engineering field can very quickly permit the junior engineer to receive the recognition that he deserves. Repeated publication of articles of a high technical caliber can have a very direct bearing on professional recognition and professional advancement of the junior engineer. This is very readily recognized by the employer. If his junior engineers receive the professional recognition to which many of

them are entitled, the employer is faced with having to pay his junior engineers salaries to which they should be entitled or with losing them to firms who will pay them salaries more in line with their value. This is not desirable and so the junior engineer is very seldom permitted to write about the work he has done.

The Journal of the Sanitary Engineering Division . . . earnestly solicits manuscripts . . . (and) it is hoped that more junior engineers will take advantage of the opportunities . . . (Ross E. McKinney, "Professional Development and Publications," SED Journal, Vol. 82, SA 5, October, 1956-24-2).

These calls for publication and reflections on the professional status of sanitary engineers as the SED Journal was going into bi-monthly, bound periodical publication, and as the new federal program of 30% incentive grants was being initiated - as the economy was booming, suburban growth was increasing and water resources were being pressured - suggests the continuing problems of "the professional status of the engineer" (Meikseins, 1991). Even the new support structure for occupationalizing represented by publications in the new SED journal was in jeopardy because of the work conditions of junior engineers. Notice that the nature of the external pressures influencing professionalization in the case of the 1950s sanitary engineer included new federal legislation but lacked the social movement influences. What does this contrast mean?

In the first quote on professionalization the author (D. Howells) noted that young sanitary engineers entered the field without "those feelings of enthusiasm, devotion, and jealous regard for the honor of his profession that must be developed to a high degree if engineering is to be considered a profession, rather than applied technology." If we look ahead to the 1970s a tremendous difference in enthusiasms and devotion are evident in our intensive interviews with initial incumbents influenced by the environmental movement work roles in the sanitary engineering field. Even a "jealous regard for the honor" of the work could be posited in the 1970s and 1980s, in contrast to the seeming problems in this regard of the mid-1950s. To what can we attribute these differences? The internal support structures were very similar by 1956: associations, divisions, journals, technical meetings, some educational programs, and employment in civil service and consulting work organizations. There was even an eight

year history of federal involvement in wastewater (since 1948), and there was a new, (to that point unprecedented) large-dollar federal 30% incentive grant program in the works.

The answer would appear to be that other than the new federal program there was no other external influence on the build-up of social structure (support structures) or the increase in group consciousness, and that the internal influences seemed inadequate to build up sufficient social structure and group consciousness. In fact, there were even internal pressures in the work site to damp occupationalizing: the junior engineers were not encouraged to write technical articles and publish. Here, also, we can see the influence of the external social movement in the 1970s and 1980s adding an extra push to create, write up and report sanitary engineering reports. The late 1970s and early 1980s were a robust time for junior engineers to write technical articles about river bottom sediment, water quality, pollutants, runoff, cross-media effects, toxins, and all the "environmental" issues. It would be hypothesized that the employers in the newer, environmental work sites had less ability to prevent publications than did the 1950s employer. How did this change come about?

An important part of the answer is that in the field of sanitary engineering, increasing evidence of a transition from "engineering" to "environmental" orientations was occurring during the period 1956 to 1972. However, this transition at first started out slowly. The SED Journal for this period included, for example, reports that in 1957: a new certification program qualified 259 sanitary engineers; also, a new graduate program in Sanitary Engineering was established at Illinois Institute of Technology (by 1966 there were to be 2-3 dozen programs). Other early signs of some change "in the wind" were increasing reports on the pressures of growth in the suburbs for sanitary sewage disposal, which was reported as the most serious problem by many state sanitary engineers in 1957. In the late 1950s there were also increasing reports in the SED

Journal about the progress and problems of the education and securing of sanitary engineers. Yet, on the other hand, a continuing engineering (not an ecological balance) view seemed to persist. In 1960 a lead article in the journal entitled "Man versus Environment" suggests, in the use of "versus", such a continuing engineering outlook. The environmental movement had not yet hit - Rachel Carson's book Silent Spring was not published till 1963.

In the May, 1961 issue of SED Journal P. H. McGauhey, director of the Sanitary Engineering Research Lab and Chairperson of the Division of Hydrology and Sanitary Engineering at the University of California, Berkeley, published an article entitled "Sanitary Engineering Comes of Age." This article is a good summary of where the sanitary engineering role had come from and where it was going in the period just prior to impact of the new environmental movement. Because our hypotheses include the influence of the environmental movement on the prior position of sanitary engineer, and because we need to establish as accurate a view of the conditions and status of this prior position, we would like to make a long quote from McGauhey's article. This 1961 commentary gives a flavor of the internal state of the field just prior to the external impact of the environmental movement. He noted:

From its beginning in the 1920's, sanitary engineering as a specialty soon developed into an undergraduate option in the civil engineering curriculum. Inadequate preparation in the basic sciences, however, proved to be a serious limitation which educators first sought to overcome at the expense of more traditional applied civil engineering courses. After World War II, such courses gave way instead to socio-humanistic studies. Thus, the educational base of engineering was broadened and generalized at the expense of undergraduate specialization. Sanitary engineering then began a move into the graduate school. There it was confronted with both academic and financial problems that the predominantly undergraduate institutions are finding difficult to resolve in the face of limited student interest and of competition with the few larger institutions able to offer both the Master's and Doctoral degrees. Nevertheless, more than sixty engineering schools desire to continue their former undergraduate specialty offerings as a fifth year program leading to the M.S. degree. They are encouraged in this by the availability of funds for graduate student support and facilities appropriated at the federal level in hope of attracting students to the manpower-short profession of sanitary engineering.

On the other hand, they are discouraged by the cost of competing for the mere 413 total graduate students enrolled in sanitary engineering during 1960. . . .

. . . A brief generation ago the term "sanitary engineering" was little more than a concept in the mind of Gordan Fair of Harvard University. Elsewhere water supply and sewerage were essentially problems in applied hydraulics just as they had been since the days of the Roman Empire. This was especially true of sewerage which in those carefree days was uncomplicated by biochemistry, BOD, oxygen transfer, and so forth. Instead, it was usually a straightforward civil engineering problem involving computation of the size and slope of sewer tile required to lead untreated sewage to the nearest watercourse. . . .

Such was the undergraduate scene in the early 1920's and such was engineering practice in an area soon to emerge as sanitary engineering. However, giants had been at work in the field of water purification for several years. By the time the first would-be sanitary engineers entered graduate school the impact of men like Langelier, Black, Hazen, Buswell, Butterfield, Streeter, and Fair, to name but a few, suddenly burst upon the engineering profession. Almost overnight the need for a knowledge of sanitary chemistry and bacteriology on the part of the waterworks engineer became recognized. Furthermore, it was recognized that engineers stood on the threshold of an age of sewage and industrial waste treatment . . . (SED Journal, Vol 87, No. SA 3, May, 1961, 1-12).

Notice that even as of the late 1950s and early 1960s there was a problem at the universities with "limited student interest" in the field of sanitary engineering, even with the availability of federal funds for graduate students. Of course, this commentary is interesting in its recounting of the imminent changes in the knowledge base of the field - from the carefree days of merely designing "the slope of the tile" for runoff to the more modern inclusion of biochemistry and bacteriology. However, these internal changes were not yet matched by the external influence of any social movement or societal trends. The sanitary engineers remained few in number, isolated, worried about professional status. The new "threshold of an age of sewage and industrial waste treatment" could be foreseen in intellectual terms and continued to develop internally in the graduate schools, but lacked the political base that the later environmental movement could give it. McGauhey continued:

The undergraduate schools of engineering were quick to recognize the inadequacy of a program which did not provide in its civil engineering curriculum room for specialization in this new area. Those who aspired to teach sanitary engineering hastened to improve their own backgrounds through courses in chemistry, bacteriology, epidemiology, microscopy, statistics, mathematics, and design. And as this knowledge alone proved

inadequate to explain or to circumvent the problems of waste disposal, professors assumed also the responsibilities of research . . .

. . . a reappraisal of engineering education followed World War II. At that time sanitary engineering left the undergraduate scene for what is now generally agreed to be a more appropriate location in the graduate curriculum. . . Looking back now over the breadth of environmental problems with which sanitary engineering was to become concerned, it is easy to see that it was destined to become increasingly a graduate program . . .

Establishment of sanitary engineering almost exclusively as a graduate program has not resolved all of the old problems which beset it as an undergraduate option. Furthermore, new ones have derived from the broadened scope of the field, as air pollution, radiological health, industrial wastes, biological engineering, industrial hygiene, and many aspects of environmental control have been added to its original concern with water supply and sewerage. . . (yet) the student whose undergraduate study has been in civil engineering, which represents the principle source of sanitary engineering graduate students, still enters the program with an inadequate background in the biological sciences.

(Because graduate students do not want to take many terms of undergraduate biology and chemistry, adding to the overall length of their degree program) The result is that the sanitary engineering department must often provide on its own staff scientists with the competence to teach necessary subject matter. Hence, the engineering staffs of larger schools often include Ph.D. chemists and biologists who have become oriented and interested in the application of their knowledge to engineering problems (SED Journal, Vol 87, No. SA 3, May, 1961, 1-12).

Did this "broadened scope of the field" result in vast new numbers and a appropriate new influence for the sanitary engineer? There is no evidence of this as of 1961. Despite the fact that the broadened scope of the field now went beyond traditional water supply and sewerage to include air pollution, radiological health, industrial wastes, biological engineering, industrial hygiene, and many aspects of environmental control, did the actual numbers and influence of sanitary engineers reflect this enlarged, abstract work jurisdiction? McGauhey concluded his article with the following comments:

. . . That there is, in fact, competition for graduate students may be judged from the fact that in 1960 there were some 57 schools offering sanitary engineering to a total graduate enrollment of 413.

. . . In spite of the need for increasing enrollments in our graduate schools to overcome current shortages of sanitary engineers, many are beginning to question whether enough students shall ever be interested to justify all of the institutions seeking to remain in the field of sanitary engineering.

(Another problem is establishing a yardstick for measuring what an appropriate graduate program should be). The groundwork for

the resolution of this question was, however, laid at Cambridge, Massachusetts in June 1960 at a conference on Graduate Education of Sanitary Engineers sponsored by the American Sanitary Engineers Intersociety Board (ASEIB) in cooperation with NSF, Harvard University and Massachusetts Institute of Technology (MIT). On that occasion, it was recommended by more than a hundred educational leaders in the field that ASEIB take a strong position favoring accreditation of Master's programs in sanitary engineering and related disciplines; support ECPD in such accreditation; and, in the event ECPD elects not to continue such accreditation, undertake to develop its own accreditation program.

. . . (while some departments have large staffs and small graduate enrollments) such staffs thrive on research. Research develops and improves the competence of the professor. This, in turn, enhances the reputation of the professor and his institution and attracts graduate students . . . Thus, a large staff of highly productive and competent instructors begets the research which supports the staff and the graduate students . . . To the profession it means that by moving into the graduate years, sanitary engineering has been given both a scope and quality formerly unattainable; it has come of age (SED Journal, Vol 87, No. SA 3, May, 1961, 1-12).

Several commentators submitted discussion pieces following McGauhey's paper ("Sanitary Engineering Comes of Age"). One by H.F. Gray noted that at the University of California the sanitary engineering (undergraduate) option began in 1905 under Hyde, who was influenced by Sedgwick at MIT, and that both Sedgwick and Hyde were "biologically oriented". Gray emphasized that in 1907 graduates called themselves "sanitary engineers" and that the writer and others went directly into experimental research on water filtration. Still, it would seem that McGauhey was generally accurate in describing most wastewater treatment work orientations as tending toward engineering perspectives - witness how telling the criticism of "dilution is not a solution" was in 1961, when McGauhey was writing.

Instead of the squabbles over which internal, academic field researchers had a good grasp of water quality essentials, it seems much more important to examine the really massive transition in the nature of wastewater treatment created by the external currents - namely, the growing environmental movement.

In the early 1960s many more people were drawn into outdoor recreation as an activity. Criticisms of growth were becoming more prevalent. The consumer movement was picking up speed with critiques of

auto safety, truth in advertising, and on the nutrition front. Rachel Carson wrote her book on pesticides, Silent Spring, in 1963, which was widely read and discussed. Local preservationist associations were beginning to become national organizations at this time (Dunlap & Mertig, 1992). For example, the Michigan chapter of the local, California-based Sierra Club was founded in East Lansing in the spring of 1963. Also, the impact of systems thinking, combined with a shift toward biology as an "iconic" image (Boulding, 1965), contributed an imminent development in academe that provided a serrindipidous trend joining into the nascent social movement.

This year, 1963, seemed to be a year when several smaller watershed developments on the local level were diffusing as separate streams building toward what was becoming a "mainstream" of new environmental consciousness. What was happening in this banner year for nascent environmentalism in the sanitary engineering field?

The stream was running faster in the wastewater treatment and water quality field as well. For example, the Sanitary Engineering Division of the American Society of Civil Engineers (ASCE) joined with eight other divisions in 1963 to sponsor ASCE's "First Environmental Conference" (in Atlanta). This conference had a leadoff presentation on "environmental engineering as a systems approach to civil engineering problems" and included discussions of environmental health engineering, the impact of computers on environmental engineering, environmental considerations in metropolitan planning, a report on sanitary engineering research and other topical interests of the day such as nuclear war, the peace corps, and environmental aspects of third world development (SED Journal, Vol. 89, No. SA 1, January 1963, 1-3).

Other signs of the tide toward environmentalism included reports of a new lab for the Public Health Service in Atlanta, Georgia providing facilities to supplement national field studies of pesticides, insecticides, and herbicides in streams, lakes, and ground water. A report

that the Water Resources Committee of the Association of County Commissioners of Georgia had a new symbol:

He is "Georgia Quacker," a wild duck who is "fighting mad" about water pollution.

- Make the timely, helpful ideas of Georgie Quacker available to all through the sale of colorful labels and postal imprints . .
- promote the use of bright, stimulating Georgie Quacker signs on billboards in Georgia to promote "Clean Water".
- study and advocate legislation that will strengthen the laws of Georgia pertaining to public streams and lakes . . .

(SED Journal, Vol. 89, No. SA 1, January 1963, 8).

Another article reported a new program and lab at Stanford University:

Stanford University's Water Resources Program in the Department of Civil Engineering is in full swing with the opening of its new sanitary engineering laboratory for Water Quality Control Research. The objectives . . . are to conduct fundamental research in water pollution and potable water quality control. Topics now under study include the movement of virus in ground water, sewage reclamation, aerobic and anaerobic biological waste treatment, radioactive fallout, and the economic evaluation of water quality control.

The new water resources program . . . (offers) a blend of courses ranging from chemistry, microbiology, and hydrology to economics and political science . . . Twenty graduate students are now in the water resources program (SED Journal, Vol. 89, No. SA 1, January 1963, 9-10).

Cornell University also reported a newly established Water Resources Center meant to coordinate (in an interdisciplinary way) "many areas of specialization in this field on the campus" - to coordinate instruction and research, and promote new courses and studies with an interdisciplinary framework." "Water Resources" was designated as a new field of instruction in the Graduate School. The Department of Sanitary Engineering, one of the groups in the Center, received \$186,000 in grant money from the Public Health Service for graduate training in Water Resource Engineering

Another important sign of the times was a report on a U.S. Senate water research bill:

Federal funds up to \$20,000,000 per year would become available for water resources research under a recent bill passed by the Senate. The House of Representatives is now considering it.

The bill would authorize outlays of not more than \$100,000 annually to every state. This money would establish water research centers at land-grant colleges and other educational institutions. Another \$5,000,000 in matching grants would be

available to states for conducting research projects. And up to \$10,000,000 would be available through the Interior Department for grants or loans to public and private research organizations for water conservation studies (SED Journal, Vol. 89, SA 4, August 1963, 6).

On the wastewater treatment plant front unprecedented increases in activity were occurring during 1963. The City of St. Louis passed a 95 million dollar bond (the largest ever in the wastewater field) to do treatment of municipal sewage and "stop direct dumping into the river." The SED journal sounded, also, a note of success: 97% of the populations along the main stem of the Ohio River now had (primary) sewage treatment plants in operation. Fifteen years before (1948) that percentage was 1%.

However, while the 1948 law had initiated primary treatment plants in many areas of the country, and there had been at least 15 years of substantial activity by "sanitary engineers," the larger story was just emerging: 1963 to 1972 was obviously becoming a major transition - from "sanitary engineering" to "environmental engineering". No longer did the SED journal publish primarily technical engineering articles on wastewater treatment plant design and operation.

Meanwhile, at the national level, the SED Journal reported that:

The Executive Committee believes that the Water Quality Council has now found a sense of direction and is moving forward with a definite program. Present emphasis is on sponsoring a specialty conference in 1965 or 1966 on engineering research needs for the establishment of water quality criteria (SED Journal, Vol. 89, SA 4, Aug. 1963, 6).

With the establishment of water quality criteria, standards could be set - this was to lead toward the NEPA permitting system incorporated in the 1969 NEPA and 1972 Clean Water Act. The interaction between internal (immanent) and external (movement) processes was leading toward establishing the "technical service base" (Wilensky, 1964) for new clean water manager occupations.

Back on the rivers and lakefronts, detergents were piling up. Conference reports from 1963 included descriptions of soap suds on the southern Lake Michigan shore and increasing detergents in municipal treatment plants and in rivers and streams. Regulatory legislation banning

non-biodegradable detergents was being debated. Unlike the 1956 issue of garbage disposers and their increase in grease, which had been approached as another engineering design problem, the newer environmental consciousness - fueled in part by the growing consumer movement - was increasingly oriented toward regulation. How was this emerging environmental movement affecting the "sanitary engineer"?

It is true that in the 1950s and earlier the specific areas which defined the field of sanitary engineering (approved, for example, in the official definition of the Committee on Sanitary Engineering and Environment of the National Academy of Sciences - National Research Council in 1954, and adopted by the American Sanitary Engineering Intersociety Board in its certification procedures) included not only water supply, treatment, distribution, wastewater collection and treatment, milk and food sanitation, housing and institutional sanitation, insect and vermin control, rural, camp and recreation park sanitation, the prevention of radiation exposure but also "The control of pollution of surface waterways and groundwater and of surface and subsurface soils," and "The control of atmospheric pollution and air quality and of light, noise, vibration and toxic materials." The summary statement of the "sanitary engineers" work jurisdiction included "Other fields that have as their major objective the control of environmental factors affecting health."

However, even though water quality, air quality and other environmental factors affecting health were omnibus conceptual articulations of the sanitary engineer's work jurisdiction, it is clear that with an enrollment of only 413 sanitary engineers in the 1961 graduate programs that this wide-ranging, and conceptually inclusive list of duties could not possibly have been making a "technical service" (Wilensky, 1964) impact on the scale implied by the language of the definition. It was the emerging environmental consciousness - the several streams of social movement that carried this consciousness into the new

conferences, the new graduate programs, the new federal funding, the new local municipal bonds - that would lay the foundation for the few sanitary engineers of 1961 to become the 30,000 environmental engineers graduating each year by 1990. What role did the build up of social structure for the work role play?

The ASCE sanitary engineering division publication, the SED Journal, started an occupational "Newsletter" that began appearing regularly in 1963. The "Newsletter" is the section attached to the technical papers which discusses occupational matters. Previously this newsletter had been sent out on an occasional basis as a mailed newsletter, not included in the journal. Even when the bound bi-monthly journal format began in 1956 the occupational "news" continued to be sent (that is from 1956-1963) as a mailed newsletter. After 1963 the "News" becomes longer. Whereas in the 1950s it was 2-5 pages, in 1963 each bimonthly "news" is 14-18 pages long, reporting on more laws, more graduate programs, more professional news. This represents a stepped up pace in the build up of social structure and group consciousness - that is, doing something together around which (as meaningful routines of behavior) there is "news."

In 1964 the 2nd Annual Environmental Engineering Conference was held with the broad subject of "Pollution of Water." There were discussions in the "News" about why the ASCE SED division is the best forum for professional concerns.

. . . All of the other organizations represent a mixture of professional and subprofessional operations with the subprofessional operations controlling the overall effectiveness. This is what limits WPCF, AWWA, ACS, APHA, and APWA. (SED Journal, Vol. 90, No. SA 5, October, 1964, 1).

With the field of sanitary engineering evidencing growing pains, the division is admonished to take a more active role in influencing graduate education programs, technical developments, research, communications, administration, and government legislation. It is suggested that meetings have a policy of more focused topics (rather than general papers), that a clearer definition of the field be established, and that the SED should

"take the lead in contacts with (government), . . . (making) efforts to keep informed of bills . . ." Additional discussion includes an emphasis on the economics of regional water quality management with a review of a book by Allen V. Kneese (director of water resource studies for Resources for the Future) on that subject:

Noting the rise in federal, state, and interstate abatement activities and in natural science and engineering research, the study points out the need for parallel research in the economics of the spreading problem of pollution in the United States.

"The costs imposed upon water users through the discharge of wastes into watercourses are large," Mr. Kneese writes, "and potential costs are increasing rapidly . . . Economic institutions on which we customarily rely to balance costs and returns - the interaction of market forces in a private enterprise system - do not perform this function satisfactorily for waste disposal. Aesthetic nuisance in a stream destroys public values that are not marketable. In deciding how to dispose of its wastes, an upstream firm or city is not forced to take into account the costs imposed upon downstream water users or the value of water use opportunities foreclosed by its effluent discharge."

The study addresses three main issues: How does one decide upon the quality of water to be maintained in a stream, devise the best physical system for achieving it, and determine the best institutional arrangements for management? (SED Journal, Vol. 90, SA 5, October, 1964, 17-18).

We have previously noted, in our theoretical discussion in Chapter 2, that a "third order legitimation" (Berger and Luckman, 1967) involves an elaboration of a theory of an institutional arrangement. The theory of a need for a "public good" approach to pollution, and water quality institutions as primarily public institutions, was being developed during this period of the early 1960s. There were, however, six general groups of sanitary engineers at this time. A letter to the editor, joining the discussion of where SED division should go, outlined this theme:

. . . The engineer's basic frame of reference is necessarily related to his professional orientation and activity. These can fall into six general groups, with considerable overlap depending on each individual:

- state and federal government engineers concerned mainly with public policy, research, promotional, and regulatory activities,
- consulting engineers rendering service usually to units of local government,
- engineering educators preparing students to meet the sanitary engineering needs of a dynamic society,
- municipal engineers concerned with planning and operating facilities, and
- industry engineers involved in product or process development and equipment sales.

ASCE is at this time the only organization where sanitary engineers can approach and discuss their problems and come up with a consensus. The other quasi-professional organizations, as noted by Mr. McKinney, are either narrowly oriented, commercially dominated, or include a wide spectrum of non-engineering people. (SED Journal, February, 1965, 9-10).

The author of this SED Journal "News" letter to the editor argues that SED, as an organization, was evolving to become a vehicle for academicians and a small number of consultants, and that, as a consequence, there were some weaknesses becoming apparent. He argues these weaknesses included:

- Application of known technology. The lag between technological advance and its use in designing, constructing, and operating facilities.
- Political and governmental competence. This includes influencing federal and state policy and encouraging logical local action. (I think it can be demonstrated that on the state and local level the influence of sanitary engineers as a group on public policy is almost non-existent).
- High level technical leadership. We too often see technical accommodation, particularly at the local level, to political considerations. We very seldom see the political accommodation to the technical need. This is evidenced and can be documented "ad nauseam" by the tremendous sanitary engineering needs evident in practically every major urban center in the United States. Unfortunately, it has reached the point where leadership in promoting adequate sanitary engineering facilities is originating from non-engineering sources since the needs have become so basic that they are now apparent to everyone and the leadership vacuum must be filled. Of all engineering activities, sanitary engineering practice lies in a political and governmental setting. Either we must lead or we will follow. (SED Journal, February 1965, 9, Robert D. Hennigan, Principal Engineer, Office for Local Government, Albany, NY).

We are looking for transitions in "work jurisdictions" from sanitary engineering to environmental engineering with the hypothesis of movement effect creating new areas of knowledge or emphasis. This movement effect is offered as a supplement to the "systems" view of Abbott (1988) emphasizing competition (between nascent professions for existing work jurisdictions). To do this we have noted that a conceptual definition of sanitary engineer from 1948 to 1963 existed that was very inclusive. However it appeared that the power of the sanitary engineers and their numbers were both weak and small to such an extent that the broad, inclusive conceptual definition of the work jurisdiction could not be matched by so few practicing sanitary engineers in 1961. We have seen that

even as the consciousness of environmental topics increased in the early 1960s, and as the sanitary engineering division built-up more social structure in the form of increased publications, graduate programs, and conferences, that the political resources these developments represented were limited by the inability to translate growing knowledge (technical and paradigmatic) into environmental results at the local and state level.

The argument, then, becomes one in which we note that the social structure was there, and the nascent ecological consciousness was becoming widespread, but that it was going to take the environmental movement to translate these essentially imminent developments in sanitary engineering into the widespread impact that was to come. It was going to take the environmental movement to bring in NEPA and environmental impact statements - which vastly broadened the work jurisdiction. The "hint" of this coming transformation was given in the "detergent problem" of 1963 - the early signs of a shift from "technical accommodation" to "environmental regulation".

From a resource mobilization view this extensive internal build up of social structure within the traditional work jurisdiction of the "sanitary engineer" provided ready-made, public-goods-academic-fields, nascent professional organizations, and job descriptions. What was needed was the extra push of the movement itself. The shift toward more internal build up of social structure in the mid-1960s among sanitary engineers was accompanied in the ecologically conscious year of 1965 by unprecedented discussions in the SED Journal surrounding the "profession". More than a dozen articles and letters appeared in this year in the "News" on the topic of professionalism.

Of course, this was reflecting a national trend in the mid-1960s surrounding professionalism. Recall that Wilensky published his important contribution on the topic in 1964. A thorough sociology of knowledge examination of why professionalism was such an important topic in these years is beyond the scope of this study. However it should be noted that

most probably it linked in part to conditions that had been leading to imminent developments in many fields. This was the case with sanitary engineering.

Our point, however, is that the ability of sanitary engineering to translate the imminent developments leading toward more professionalism into a build up of social structure, beyond that appropriate for academics and a few consultants, depended upon the ability of sanitary engineering to benefit from the mobilization of additional resources. The dilemma was observed by one of the discussants in the "News" commenting on the state of professionalism:

The decline of central leadership and the constant erosion of the stature and prestige of Sanitary Engineering at a time when federal government and industry have recognized the importance of controlling man's environment presents a paradox and an enigma which I fail to comprehend. (Grune, SED Journal, April 1965, 5-7).

Meanwhile, as the sanitary engineers worried about their lack of professional influence, the nation's people went outdoors more and more often. Outdoor recreation became very popular and fueled both new recreation industries and also pressure in the state legislatures and in congress for stiffer water pollution laws. In 1965 the Federal Water Control Act was passed and, at the state level, for example, recreation-conscious Michigan strengthened its pollution laws to create \$500 daily fines "for dumping injurious or potentially injurious substances into the state lakes and streams."

In December, the SED Executive Committee met to plan a schedule for a National Symposium on Quality Standards for Natural Waters to occur at the University of Michigan in July of 1966. It was also announced that the "News" would expand in August of 1966 to a larger 8 1/2 by 11 inch format mailed separately, and no longer be bound in the SED Journal. The Newsletter had become, by late 1965, long, involved and literally packed with important information (reports on new legislation, reports on "white papers", reports on progress and work role concerns) - in short, the

"occupational" updates appeared be becoming as important as the "technical" and "scientific" updates.

During the period 1966 through 1972 the SED Journal included an increasing number of articles in the "technical" and "scientific" bound volume that reflected concerns with "environmental" perspectives and pollution regulation. While the "occupational" Newsletter continued the reports on the work role there were increasing discussions in the Journal itself reflecting the transition from an engineering perspective to an environmental perspective. Some of the titles included:

- "What is Pollution? - An Engineer's Viewpoint" (1966)
- "Trends in Financial Support for Water Pollution Control" (1967)
- "State Financial Incentives for Industrial Waste Treatment" (1967)
- "A Strategy for a Livable Environment" (a report on the Gardener Task Force on Environmental Health) (1967) (In which the report cites the "need for ecologists")
- "Review of 'A Strategy for a Livable Environment'" (1968)
- "Experiences with Surface Water Quality Standards" (1969)
- "Concepts and Utilities of Ecologic Model" (1970)
- "Statewide Management - What Does the Future Hold? - The Need for Better Management", 1972 (which utilizes a report titled "Examination Into the Effectiveness of the Construction Grants Program for Abating, Controlling, and Preventing Water Pollution," Report to Congress by the Comptroller General of the United States, Nov. 1969.)
- "Environmental Assessment of Resource Development - The Need for Environmental Impact Statements" (1972)
- "Division Name Change" (from Sanitary Engineering to Environmental Engineering), Oct. 1972.

Build Up of Social Structure After 1972

In 1966 Lynton K. Caldwell had published an article entitled "The Human Environment: A Growing Challenge to Higher Education," Journal of Higher Education (37:6) in which he observed that, as of that time, "no really adequate" schools of environmental science technology existed. This view was new and a sign of the times. The sanitary engineering majors, while they had included some biology, were essentially engineering

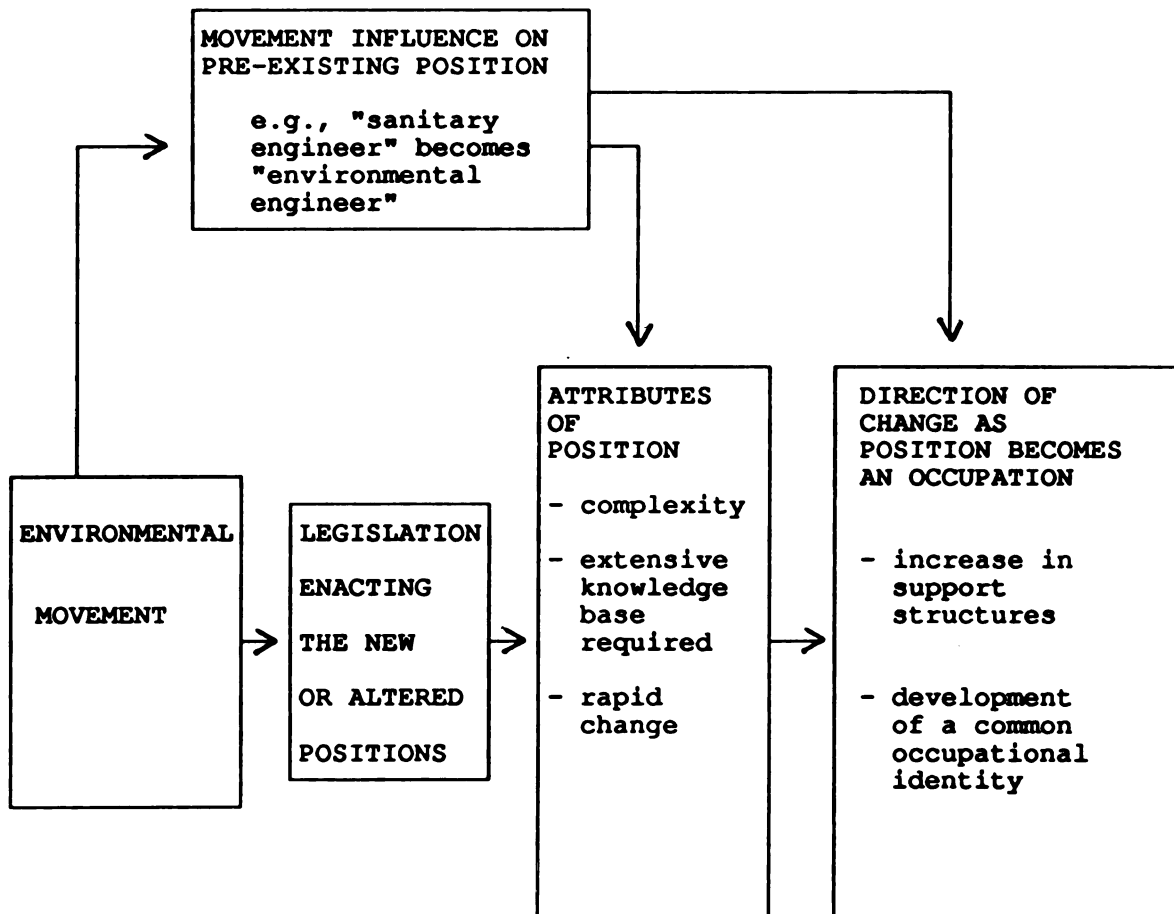
curricula. Caldwell emphasized that the newer, environmental consciousness was going to require truly interdisciplinary curricula.

For a dozen years after Caldwell wrote, the enormous impact of the environmental movement brought forth many new interdisciplinary undergraduate and graduate programs in U.S. universities (Disinger and Schoenfeld, 1978 and 1987). This interdisciplinary movement and program development created the specifically "environmental engineering" social structures and milieu our initial incumbents of the generational first cohort and job first cohort typically experienced in their formal post-secondary education. As the environmental movement shifted from its mobilization phase to its power phase, along with the new legislation and lobbying efforts came the newer interdisciplinary university programs.

Disinger & Schoenfeld (1987) report on 45 such programs in a comparative study following them from an earlier study (1978), just after their formation, with a followup study 10 years later (1987). Representatives from many of these programs contribute descriptions of their program history - much of it emphasizing the innovation of interdisciplinary programs. Disinger and Schoenfeld conclude that, despite pressures from the anti-regulatory counter movement and budget problems of the late 1970s and early 1980s recessions, the new environmental programs, which incorporated elements of the pre-existing "sanitary engineer" role and altered it under the impact of the environmental movement, survived well, maintaining enrollments and budgets. The importance of the pre-existing, "sanitary engineer" role has been established. However its internal developments were unable to give birth to the new environmental engineering without the impact of the environmental movement. We add these insights on pre-existing positions to our general causal model in a revision depicted in Figure 12, shown below.

The filtering of the environmental movement, the origins effect, the attributes of the initial position, and the attributes of the initial

Figure 12. Movement influences on pre-existing positions as exemplified in the transition of "sanitary engineer" into "environmental engineer".



incumbents through new university programs and institutes, and the feedback loops (interactive effect) discussed, were depicted in Figure 9. We revised our expected model to emphasize the importance of these new programs and institutes, for example, "interdisciplinary," "ecology," or "environmental" studies, as one dimension of the build up of social structural supports and as a contributory influence on group consciousness.

Intensive interviews also revealed memories of early and mid-1970s graduate work as being influenced by the environmental movement. The new environmental studies fields, or the new emphases in older fields (such as geography, chemistry, biology, or urban planning), were a part of the generational first cohort's experiences. The precise nature of this influence, however, is an historical question that would need to be researched more closely - especially in any effort to do a comprehensive study of current senior environmental managers as a generational cohort or generational unit (Mannheim, 1936). We do, however, have some survey results that contribute to the understanding of the build up of structural supports for occupational emergence.

Survey Results

Our 1992 survey of mid-Michigan Surface Water Division water quality workers asked several questions which can help us interpret the degree of build up of social structure in the clean water manager job. Number and type of university degrees and whether present job relates to degrees indicate structural support for the position to the extent that the academic degrees do relate to present job. Whether off-the-job training was "adequate" indicates relevance of that university program to the attributes of the position. On-the-job training may show additional build up of structural supports - this was an issue in the 1987 organizational development project where there were complaints and a municipal facilities task group formed around the need for additional training. How strongly the 1992 Surface Water Division survey respondents feel that more

specialized academic training, continuing education, or attendance at professional meetings are needed indicates current assessments in the Division of the need for additional build up of structural supports and may also measure weakness in existing structural supports.

Other survey findings of relevance include whether the respondents have seen any changes in types of knowledge requirements. If we compare the first cohorts (generational and job first cohorts) with the remaining, younger (five or less years on the job) respondents, we may see a "second cohort" effect of the new university programs impact on perception of change in type of knowledge required by the job. For all respondents, answers to "other kinds of changes perceived..." (See Table 3, List 2 & 3 above) may indicate an increase or a decrease in structural supports. Do survey respondents subscribe to or consult scientific-professional water quality or environmental journals? Do they belong to work-related associations, and so forth? If so, this would indicate the relevance of such structural supports for the job. Finally, the extent of work or work-related contacts seems relevant. Where there are more such contacts or such contacts have built-up, this would indicate more structural supports for the position, in contrast to more isolated work. Findings on degree of contacts may also be relevant for build up of group consciousness. What were the results of the survey for these several questions?

The findings for the survey question regarding number and type of university degree backgrounds were examined. We had initially screened our potential survey respondents to create a sample that eliminated primarily technical, trainee, or clerical workers in order to focus on roles with significant water quality management work jurisdictions, as indicated by their job titles and on consultation and advice from key informants (who helped design the survey, and six of whom were part of pre-test, pilot versions of the survey). We have previously reported the type and frequency of academic degrees among senior worker generational first cohort (13 years or more in water quality work). We now present these

Table 4. Type and frequency of academic degree fields for entire survey sample of mid-Michigan Surface Water Quality Division water quality workers (N = 49), and years (19--) degrees earned.

Degree Fields	Frequency	Years Earned
Aquatic biologist	5	70, 75, 87
Biology	8	64, 68, 75, 79, 81
Chemistry	1	
Chemical engineering	5	83, 75, 83, 84
Civil engineering	5	84, 89
Entomology	2	83
Environmental biology	1	
Environmental engineering	2	77
Environmental law & politics	1	85
Environmental resource management	1	77
Environmental science	1	90
Environmental studies	1	84
Fisheries biology/watershed mgt/ toxicology	1	
Fisheries science	3	85
Fisheries and wildlife	7	76, 78, 84
Forestry	2	85, 89
Geography	2	74
Geological engineering	1	78
Home economics	1	66
Interdisciplinary biology	1	82
Limnology	2	75, 80
Microbiology	1	78
Natural resources	3	85
Resource development	4	73, 79, 87
Resource economics	1	90
Sanitary engineering	1	72
Soil science (irrigation)	1	
Stream ecology	1	82
Toxicology	2	
Zoology	1	69
Zoophysiology	1	

results for the entire sample (N = 49). The breadth of degree backgrounds among this water quality management focused sample is shown in Table 4, above.

In the mid-Michigan sample there were 2 Ph.D.'s, 23 Masters, and 44 Bachelor's degrees held among the total. Several considerations are raised by the breadth of degree-background: 1) in many cases the work roles require an interdisciplinary approach - this is backed up by many survey comments on the direction of change toward cross-media issues and management; 2) some jobs are almost entirely learned on-the-job and the degree serves primarily as a screening function; 3) other jobs have direct applications of a "hard science" major in the job duties (eg., fish sampling, chemical analysis); 4) finally, several people have changed water quality jobs within MDNR such that their degrees once were relevant to earlier jobs, but their job maturity and mobility now places them in positions in which the degree is less relevant (e.g., unit or program management, or a new job-specific specialty area). Therefore not too much can be concluded about the findings or degree-background without further analysis. Overall, however, the importance can be observed not only of hard science degrees (e.g., biology, chemistry) but also the prevalence of interdisciplinary degrees (environmental engineering, environmental studies). In contrasting the 51 more traditional, hard science degrees with the 17 less traditional, more interdisciplinary degrees we can note that of the 17 non-traditional, interdisciplinary degrees, all but one of them have been obtained since 1977. This relationship is depicted in Table 5, shown below.

The titles of these degree fields were self-reported by survey respondents. Question #3 of the survey asked "What have been the higher education degrees you have obtained?" and "In what fields were your degrees?" The distinctions between "hard" and "soft" science were self-

Table 5. A comparison of traditional hard science versus non-traditional interdisciplinary degrees in terms of dates obtained for entire survey sample of mid-Michigan Surface Water Quality Division water quality workers (N = 49).

dates	non-traditional environmental programs	traditional hard science programs
1964-1976	1	20
1977-1992	16	31

reported distinctions repeatedly made in the interviews. Those interviewed distinguished "hard science" degrees as traditional chemistry or biology degrees and "soft science" degrees as non-traditional "environmental studies." In the interviews the tendency was to identify the non-traditional degrees as a more recent interdisciplinary phenomenon. This view was also reflected in the literature reporting changes in environmental studies (Disinger and Schoenfeld, 1987). In addition to changes in degrees (more soft science degrees over time) there were also changes in on the job training.

With regard to additional specialized training, 26 responded that they had received some, 19 said none. The existence of such programs suggests the development of structure within the occupation. The list of respondent descriptions of that additional training is shown in List 6, shown below.

Most respondents took MDNR sponsored workshops, a few took additional university classes, and two have continuing positions in which they act as adjunct instructors at nearby universities and have taken additional graduate or post-doctoral work in their field. This suggests that there has been a range of specialized training required in recent

List 6. A list of responses given describing additional specialized training recieved by mid-Michigan Surface Water Quality Division water quality workers.

-
- hazardous materials training
 - various workshops
 - several short courses
 - environmental education
 - groundwater, water chemistry, water quality monitoring, wastewater treatment processes, statistics
 - civil engineering
 - risk assessment
 - management training
 - air pollution control equipment and monitoring
 - environmental health management
 - computer or data base training
 - technical writing, expert witness
 - management and computers
 - toxicity identification/reduction, evaluation training, expert witness
 - three years post-doc at MSU in stream ecology
 - an adjunct (teacher) at MSU Entomology
 - conduct grad classes in Diatom Systematics at EMU
-

years that may not be able to be fully provided by the MDNR itself.

Interview comments emphasized "not enough time" to get additional specialized training for many respondents, and this would be an area where additional human resource management and human resource development policies may be needed, given the reports of general growth of knowledge and increasing complexity. Several have reported that MDNR specialized training provides the chance to make contacts outside the section - an increase in additional specialized training could help build up social structure, facilitating additional structural supports and potentially increasing group consciousness. Added liaison at the universities could do this also.

The respondents' answers to the question regarding whether their present job related to their degree show 43 answering "yes" and 5 "no". Two people mentioned one of their degrees was relevant to their current job and the other degree was not. One person stated: "My degree was less

relevant but there are college programs now which address toxics and regulatory issues."

In answer to the question which asked: "Of the skills and knowledge required for water quality related environmental work, how much of that knowledge did you learn on the job?", 42 answered "almost all" or "a great deal." This represents 85% of respondents, so clearly much water quality management work is learned on the job. One respondent commented, "You can learn environmental management without knowing much about water science." This is true for certain jobs, perhaps a majority. However, there were also many comments in the survey indicating the importance of increasing ecological knowledge. Whether this knowledge is directly relevant to a water quality manager's job depends on the job - many positions involve permitting, enforcement or project management, and are not "hard science" or water science positions (such as lab or field research and/or toxicity would be, or "storm water" expert might be). Of their prior training, 37 felt it was adequate or somewhat adequate, while 11 felt it was somewhat inadequate or inadequate.

In answer to the question "Have you had any formal training on the job?", 29 answered "yes" while 19 said "no." The list of respondent answers describing the formal, on the job training they have received is given in List 7, shown below. Of the 19 who said they received no formal training, two added comments: "There is really no training here - you learn by asking people and doing the work," and "Detailed procedure manuals were provided and guidance given."

Do respondents feel more specialized academic training is needed prior to entering their work? In the sample, 32 responded "somewhat more needed," while 11 said "not needed." Only 7 said "much needed." So we could conclude that, in general, more specialized academic training is only "somewhat" more needed. This may reflect the reports that much of the water quality manager's role is learned on the job and also that, in an

List 7. A list of "kinds of formal training on the job" received by mid-Michigan Surface Water Quality Division water quality worker respondents.

-
- learning the program and specific regulations and laws
 - short courses at universities or conferences
 - training on serving as an expert witness, wordperfect, lotus, computer software
 - one class on water quality management
 - public speaking, expert witness, management
 - CPR, first aid, data base, water safety
 - procedures for biological sampling
 - safety/lotus
 - aquatic entomology
 - writing permits, water safety, CPR
 - conducting public meetings
 - wastewater treatment, plant visits, EPA courses
 - workshops regarding water pollution control
 - engineering planning and specifications
 - aquatic toxicology, aquatic macroinvertebrates
 - water quality modeling
-

overall sense, it is specific additional specialized academic training that may be needed as the clean water manager role becomes more complex and as knowledge and laws change - not whole sets of courses or additional degrees. This is borne out by the answers to the question "Is continuing education on or off the job needed?" In the sample 22 respondents answered "somewhat needed," 21 answered "much needed" and 4 answered "very much needed", while only 2 answered "not needed." This strong response, (96% of respondents say that continuing education on or off the job is needed) suggests the impact of increasing complexity, growth of knowledge, changing laws, changes in technology (eg., measurement, or computers), and may raise human resource management and human resource development issues of access to, form of and content of continuing education.

Finally, the respondents were split on whether "attendance at meetings of professional associations are needed, with 26 saying "very much" or "much needed", while 23 stated "only somewhat needed" or "not needed." This may reflect the different types of jobs in Surface Water Division work. Some jobs are learned more on-the-job and consist of job-

specific knowledge. These types of job may change more from changes in laws, regulations and from technical changes. On the other hand, other types of work may require keeping up with "hard science" or "soft science" knowledge advances.

We have previously reported on the kinds of changes respondents saw in their water quality related jobs: 79% reported an increase in types of knowledge required, with about even increases in environmental/ecological, legal/regulatory, and technical/engineering types of knowledge. Seventy-two percent reported an increase in paperwork and 56% reported an increase in amount of contact with external lobbies or pressure groups. The list of actual responses to "changes perceived in the nature of your water quality related job(s) over recent years" was reported above. These responses on changes perceived have given us insights to help interpret questions on skills, knowledge and training.

Do mid-Michigan clean water managers subscribe to or consult scientific-professional water related or general environmental journals regularly? Again, there seems to be a split on this dimension with 21 not subscribing to or consulting regularly, while 28 do. This may result from the different types of jobs in clean water management work as well as reflecting individual differences. Of those who do subscribe to or consult scientific-professional water related or general environmental journals, 13 subscribe to or consult one journal, 5 subscribe to or consult two journals, and 11 subscribe to or consult 3 or more journals. The actual list of journals subscribed to and their frequency is given in Table 6, shown below.

Comments made on this question included: "I consult scientific literature as needed, but not regularly," "I frequently review the Amer. Soc. of Civil Engineers;" and "We get journals at work."

Do mid-Michigan clean water managers join work-related associations, interest groups, divisions or occupational organizations? Here there seemed to be a clear pattern of non-joining. Fifteen had not joined any

Table 6. Type and Frequency of scientific-professional water related or general environmental journals subscribed to or regularly consulted by mid-Michigan Surface Water Division water quality workers.

Type of Journal	Frequency
Amicus	1
Amer. Assoc. Adv. Science	2
Amer. Fisheries Society Journal	3
Aquatic Toxicology	1
Canadian Journal of Fisheries & Agric. Sci.	2
Chemical Regulation Reporter	2
Chemosphere	1
Diatom Research	1
Engineering News Review	1
EPA Journal	9
The Environmental Professional	1
Environmental Science & Technology	1
Environmental Toxicology & Chemistry	1
Fisheries	1
Journal of Great Lakes Research	2
Limnology & Oceans	1
Michigan Entomologist	2
North Amer. Benthological Soc.	2
North Amer. Lake Management Soc.	2
Oceanus	1
Paleolimnology	1
Science News	2
SETAC	1
Toxicology journals	1
Water Env. & Technology	7
Worldwatch	1
Water Pollution Control Federation Bulletin	7

association and 25 had joined only one. Moreover, of the 25 who had joined one organization, 22 of them had all joined the Michigan Professional Employees Association, (MPES), (the state of Michigan professional bargaining unit association) considered by several to be a requirement of employment. So 37 or 74% did not join any work-related organization other than MPES. This left 9 who had membership in two or more work-related or occupational organizations. The actual list of work-related organizations joined and frequency of number joining is given in Table 7, shown below. Only two of these organizations deal primarily with water quality management. This may explain why so few of the respondents are members and

may be evidence of an undeveloped area of structural support for a professionalizing occupation. The issue of why so few clean water managers join work-related occupational organizations and the implications of this phenomenon are discussed further in Chapter 4.

Table 7. Type and frequency of joining work-related or occupational organizations by mid-Michigan Surface Water Division water quality workers.

Organization	Frequency
Amer. Inst. of Chem. Engineers (AICHE) (engineering division)	3
Amer. Chemical Society	3
American Fisheries Society	4
Amer. Soc. Civ. Engineering (ASCE)	3
Amer. Soc. Toxicology Mgt. (ASTM)	1
International Assoc. for Great Lakes Research	1
Mich. Environmental Health Assoc.	1
Mich. Society of Toxicology	1
National Soc. of Professional Engineers	1
Society of Env. Toxicology & Chemistry (national and Great Lakes Chapter)	2

One of our hypotheses was that external contacts outside the work unit or section contributed to the build up of structural supports. Such contact-related structural supports might take the form of mediating, ancillary or counter-roles - all of which have emerged with the newer, regulatory environmental management organizational field. This hypothesis received a great deal of support from the survey. The basic question asked was, "To what extent do you have work or work-related contacts within Michigan but outside your section?" Twenty-nine responded "a large amount of contact," and 16 responded "some amount of contact," with only 3 stating "very little contact." Thirty-four reported that "a large amount" of these contacts were directly required by the job, with 12 reporting "some" extent and only 2 reporting "very few or little." Twenty respondents answered that these contacts had increased while 24 said that such contacts "stayed almost the same" with only 2 stating contacts had

decreased. Seventeen respondents gave written answers explaining the changes in contacts and that list is given in List 8, shown below.

Expectations of others in these organizational networks regarding this key position can be seen as providing occupational identity and the interorganizational network may then be seen as structure leading to occupational emergence.

On the other hand, the amount of contact outside the section "not directly required by your job description (people you refer to, consult, see occasionally, phone for advice, keep up with, or rely upon for advice or knowledge)" tended to be much less. Twenty-five responded "some amount of contact," only 8 responded "a large amount of contact," and 15 responded "very little contact." This suggests that while on the one hand

List 8. A list of responses describing the nature of changes in work-related contacts (inside Michigan but outside of work unit) of mid-Michigan Surface Water Quality Division water quality workers.

-
- number of public/private contacts increased with the increase in range of issues
 - more inter-agency contact
 - my position involves community outreach activities that have increased (a project manager)
 - more complex problems require more contacts. For eg., non-point problems now require contact with Soil Conservation Service and Cooperative Extension Service
 - my current job (enforcement actions) requires me to coordinate action with other DNR divisions; the Attorney General's Office; DNR District offices, and the regulated community
 - More contacts with environmental groups and concerned citizens
 - many cutbacks in programs. We (permit reviewing) are taking over responsibilities - eg., phosphorous protection of inland lakes is now handled by Surface Water instead of Inland Lakes
 - I do many more permits than I used to do
 - more contact with computer and statistical people
 - demands more of your time
 - as I get more deeply involved in the new stream water permitting program, as that program matures, there are often contacts with sections responsible for carrying out related regulations, because storm water runoff comes from so many sources; eg., landfills, non-point sources.
 - staff reductions (in DNR) leads to more work assignments which leads to more contacts
 - programs are attempting to become more multi-media oriented and taking a watershed approach
 - am in a small cubicle in a forgotten state building (owned by Eyde Co.) . . . am not "role model" state employee, been blackballed
-

job-required contacts outside the section are very high, "contacts not directly required by your job description" tend to be much lower. There is some frustration indicated in the comments in which a few respondents have indicated a need for (and the benefit of) more informal contacts, but a lack of time to develop these informal contacts. There also appears to be a considerable degree of recent position changes or turnover with several respondents reporting they have not been on the job long enough to develop their personal contacts. Of the work-related contacts not directly required by the job, reasons given and their frequency given by respondents are reported in Table 8, shown below. The first three of these reasons do suggest both the existence of occupational structure and probably a sense of shared occupational identity. It is not clear,

Table 8. Types and frequency of reasons given for work-related contacts not directly required by job for mid-Michigan Surface Water Division water quality workers.

Reason for Contact	Frequency Reporting*
A result of participation in environmental organizations	8
A result of common professional interests	28
Intended to improve your job performance	14
Due to community, civic, or other volunteer participation	9
Friends, acquaintances or school, meeting others casually in the workplace	4

* Some respondents gave two or more types of reasons for contact.

however, whether it is wastewater management as an occupation, water quality management as an occupation, or more general environmental concerns that are involved.

In answer to the question, "Have you discovered new sets of contacts over time that are helpful?", 11 answered "yes, definitely," 14 responded

"to some extent", 19 indicated little new contact. Actual responses, explaining the "definitely" or "to some extent" are indicated in List 9, below. Many of these responses suggest common occupational concerns and may reflect emergence of wastewater management and water quality management as an occupation.

List 9. A list of responses describing new sets of contacts developed over time by Mid-Michigan Surface Water Quality Division water quality workers.

-
- computer/statistical information
 - made some friends who broadened my knowledge base
 - professors, university contacts
 - outside departments, such as Mich. Dept. of Transportation
 - over time, from attending conferences and meetings have met more professionals in my field and come to know the research and interests of some. Based on this I have made limited contact for advice, etc.
 - similar interests
 - biologists from other areas in Michigan that have similar problems
 - personal university contacts
 - contacts with other environmental engineers are always useful
 - EPA contacts, Mich. Dept. of Public Health contacts, other DNR divisions
 - contacts with greater technical expertise in some areas
 - additional states as they expand and create toxic control programs
-

In answer to the question, "What proportion of work-related contacts are required by your job and what proportion of such contacts were voluntarily initiated by you?", 30 responded with an answer that 70% or more of the contact was required by the job. Only 6 responded that their own, voluntary, initiative was responsible for 50% or more of their contacts. Clearly the job-required contacts are the most important type of contacts.

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Some of these work-related contacts are with people in other states or nations, however, not all clean water manager positions have such out-of-state contact. Twenty-two respondents indicated "very little contact." On the other hand, 23 reported "some amount of contact" and 4 reported "a large amount of contact" with persons outside the state. This does not suggest a strong cosmopolitan orientation and pattern of association found in some professions. Many occupations, however, are characterized by a mix of cosmopolitan and local patterns.

In trying to measure and assess the degree to which such contacts influence water quality work, respondents were asked:

"Have contacts beyond the section influenced the development or the nature of your job or occupation? For example, does such contact help crystallize what water quality work is or what is required for the job?"

Twenty-eight responded that this occurred "to some extent," while 13 answered "little or no extent" and 6 answered "to a large extent." No one answered "to a very large extent." Twenty-two gave written answers describing the nature of this influence of contacts over time on themselves or the nature of their job. These responses, given in List 10 below, have a strong occupational content and suggest an emerging occupational identity.

List 10. A list of descriptions of the nature of work-related contacts outside the section as an influence over time on mid-Michigan Surface Water Quality Division water quality workers or on the nature of their jobs.

-
- Good to gain perspective of how other agencies/people have dealt with similar issues
 - I have become more aware of the damage which has been done to Michigan
 - Having only been here 1 year it has had a great deal of influence
 - Outside contacts introduce a new outlook on what I do
 - It has given me a feeling that I am more aware of the state of the art in the field to a limited degree. Limited due to the limited contact I have had. I would like it to develop more (outside contacts). I think it would be beneficial to the development of state programs as well as to me professionally. However I never have the time at work. And I have not had the desire to do it all on my own time
 - Without these contacts it is difficult to make any impact on the aquatic resource (e.g., stream improvement projects)

List 10 (cont'd).

- Strategies used in other states/nations for handling certain issues can be applied in MDNR
 - Not all states have same level of knowledge of water quality problems, yet all work at solutions in similar ways due to federal funding, which is not good
 - Our Surface Water quality division has begun to work more closely with Fisheries Div. - benefitting both parties
 - Most water quality data is stored and returned to EPA. To determine what the data mean as far as trend and effectiveness of water pollution laws we need to have a good computer and statistical background
 - Required changes in teaching topics & techniques
 - As we begin to solve non-point pollution problems it is necessary to contact experts in the field and develop strategies based on their research and experience
 - It helped me realize what other sections/individuals were expecting from me
 - By working at EPA (in past) I can, to some extent, compare how Michigan's programs compares with other Region V states
 - Additional contacts have helped me develop more confidence in what I do
 - It gives another perspective on how others view things
 - Have a better overall picture. Also see technology in use in other states before Michigan tries it
 - Improves the understanding of the issues, exchange of ideas to solve problems
 - I am considered a "storm water expert", but much of my expertise has come from contact with industrial representatives and state and federal professions to give me a balanced view of the issues
 - I became more aware of how the regulated communities feel
-

Summary. It could be concluded from the survey findings that some structural supports have built-up for clean water management work - scientific-professional water related journals exist and are subscribed to - but occupational, work-related organizations are not a significant part of the sample's experience. Could civil service human resource development policies alter to encourage such occupationalization? Are the reasons for this lack of "professionalization" more characteristics of "engineers" or "impact technologists," environmental or otherwise? While additional specialized training may be restricted to focused short courses in specific areas, the amount of continuing education clearly seems to be increasing for clean water managers. Does increasing cross-media environmental management lead - through short courses or long - to a build up of more social structure and group consciousness? That is, does growth

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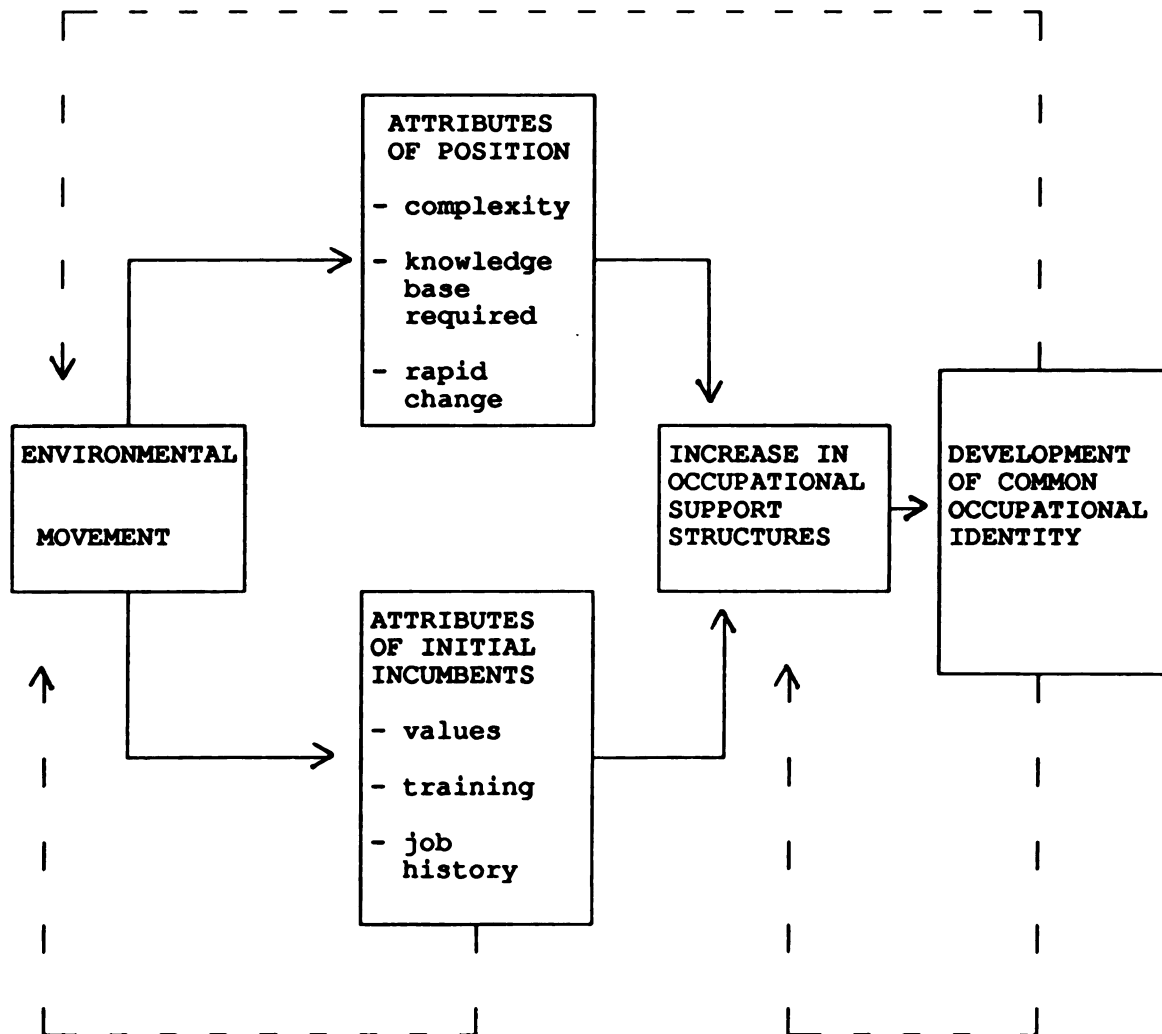
of knowledge and complexity, along with contacts, lead toward greater self-organizing (e.g., toward self-governing, professional identifications?). The amount of work-related contacts suggest this possibility. Will increased contact serve to build up not only social structure but also group consciousness? As this brief summary makes clear, many of these questions raise the issue of the level of group consciousness among clean water managers. To this question we now turn.

Research Question #8: Has a consciousness of occupational identity emerged?

The attributes of initial incumbents (cohort effect), the attributes of the initial position (origins effect, knowledge and complexity effects, organizational field effect), and the continuing environmental movement (movement effect) all appear to contribute to development of a common occupational identity. This occupational effect is shown in the lines of influence depicted in Figure 13, shown below. The interactive effects of increasing occupational identity are depicted with the dotted return lines indicating feedback loops. The question of consciousness of occupational identity has been studied through secondary literature, interviews, and through certain questions in the Surface Water division survey questionnaire. The hypothesis that, over time, additional structural supports have been added received some support in our review of survey results in the previous research questions. If the clean water manager role, as a labor market position, is becoming more of an occupation, there should also be indications of a higher degree of group consciousness. Is this so?

How do the DNR water quality worker identify themselves? Do they have a concept of work identification that delineates them as an occupational group? To repeat, an occupation is more than a job or a collection of work activities. It involves an 'occupational personality' (Becker & Carper, 1956), that is, a degree of consciousness of kind,

Figure 13. Emergence of consciousness of occupational identity (occupational emergence).



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summarized by the term 'identification'. Hebden notes:

. . . the stronger the identification is that members feel with their occupation, then the more likely it is that other important indicators of occupation will also be present. These indicators would include level of skill and training requirements, the presence of an occupational career, and the existence of an occupational ideology. (Hebden, 1975, 107-108).

The three main variables Hebden dealt with were 1) commitment to the occupation, 2) reference group choice, and 3) concerns with autonomy. It should be noted that he worked with experienced people in the upper end of data processing work, a category somewhat similar to the senior worker, first generational cohort in our study. In analyzing the history of computer programming Hebden raised the question of whether or to what extent this type of work was becoming an occupation. We may ask, is there a history of occupational identification in the labor market positions in the water pollution control and water quality management system?

Historical Evidence Regarding Water Pollution Control as an Occupational Identity

The Water Pollution Control Federation (WPCF) publishes much industry-relevant information. The WPCF Careers in Water Pollution Control (1981) brochure noted that in the general history after 1965, water pollution control jobs increased, and that by 1981 the scope of some personnel needs in the water pollution control industry indicated a shift in the need for different jobs. For instance "editors/reporters" had an annual increase in demand of 11.6% for the years just prior to and including 1981. This suggests growing activity in group consciousness during the "origins effect" or early occupational formation period (1977-1981) since editors and reporters were presumably writing about the occupation. There were also more biologists demanded (a 4.7% annual increase) indicating a relative shift from an engineering to an ecological paradigm. [See Table 1, p. 3 of WPCF bulletin #150].

Within the mandated organizational field the national laws and EPA administrative rules help alter and guide job descriptions and job

requirements. Wastewater treatment plant employee advancement, for example, is closely related to certification and licensing. Many states require formal training in water and wastewater operations to qualify for a license. Training programs are sponsored and conducted by government agencies and organizations such as: Water Pollution Control Federation (WPCF), American Public Works Association (APWA), and Water and Wastewater Equipment Manufacturer's Association (WWEA). The Municipal Facilities Section under study participates in this certification as a reviewing agency. Certification procedures reflect both occupational structure and a specific occupational identity relevant to both the reviewing agency role and the employees being reviewed.

The typical personnel in a wastewater treatment plant (and more generally in the wastewater pollution control industry) are listed as: chemist (analyzes), industrial waste inspector (inspects and investigates), lab technician (routine analysis), mechanic (repairs), sewer maintenance worker (inspects and clears), superintendent (administration), wastewater operator (equipment operation), and the sanitary engineer. Many of these positions were established as ancillary work roles at municipal wastewater treatment works prior to the shift in the environmental movement toward regulation in the 1960s and 1970s. By briefly reviewing the already existing roles we can distinguish the different nature of the subsequently emerging environmental management roles that are the subject of our study. However, still other roles were newly created in the wastewater industry as an impact of the environmental movement.

In our review of the occupational emergence of the newer environmental roles (research question #7) we noted the early, longer-standing labor market position of the "sanitary engineer". How has the shift from the earlier sanitary engineer work role to the contemporary environmental engineer work role changed patterns of consciousness and

occupational identity? The 1981 WPCF bulletin describes the sanitary engineer as follows:

Sanitary Engineer: Sometimes known as Public Health Engineers, Sanitary Engineers work in a variety of areas. They design and direct construction and operation of projects such as water works, WWTP and other sanitary facilities. Sanitary engineers also may be responsible for a major segment of public health engineering programs such as Wastewater disposal, water pollution control or water supply, and also in the development of watersheds and direct the building of aqueducts, filtration, storage, and distribution.

Some sanitary engineers work in environmental protection programs and investigate complex stream pollution problems. They make detailed engineering investigations and studies of wastewater and industrial water treatment. They investigate conditions in public waterways, industrial plants, public and private sewer systems, industrial waste treatment plants, and wastewater disposal plants. This work may involve collecting samples, making flow measurements, and preparing detailed reports, sketches, plans, and diagrams of factors affecting the pollution problem. The engineer must then evaluate the condition of treatment facilities and the effectiveness of the treatment process. [Note: as a participant in DNR organizational development projects this researcher can report that the sanitary engineer is also concerned with the effectiveness of the organization, or the organizational capability] (WPCF, 1981, 5).

The demand for pollution control manpower was increasing in the late 1970s and early 1980s and this WPCF brochure noted that "many thousands" of persons were needed to "manage the environmental quality of the US." They noted that it was an expanding field; that the workforce covers more than 120 occupations, "many of which did not exist 5 years ago." (WPCF, 1981, 5-6). As they noted:

The largest increase in demand for manpower will be by local government as they staff up to operate the new system of wastewater treatment plants that will be in operation by 1983. (These plants will require many skilled, experienced operators, as well as substantial unskilled and semiskilled workers) (WPCF, 1981, 6).

An increasing concern with environmental problems for people in these positions could be expected to contribute to a shared occupational identity involving the attempt to solve these problems. The sense of mission provided by the link of their occupation to the environmental movement may help to produce group consciousness of a common occupational identity.

What kinds of consciousness of work identity do mid-Michigan Surface Water Division water quality workers have? Blum, et al., (1988),

demonstrated that a common occupational identity is a significant measure of when a new occupation has emerged. Do mid-Michigan Surface Water Division water quality workers have a common occupational identity?

Survey Results

In the 1992 Surface Water Division Survey we asked "To what extent do you see your present or past job(s) as being part of an occupation that includes but is broader than your present job?" Twenty-eight answered "to a large extent" or "to some extent" while 10 answered "not at all" with 11 leaving the question blank. Fifty-seven percent of the sample, then, see their present work as being part of a broader occupation.

When asked "How would you describe your occupation?" 24 responded with similar occupational labels utilizing the label of "environmental" (e.g., environmentalist, environmental protection, environmental manager), a general academic "environmental" field (eg., natural resource development, environmental chemist), or general words signifying an "environmental" type of work (protecting surface water). Only 6 answered either a specific hard science (toxicologist, aquatic biologist/toxicologist) or a "program" identity (wastewater treatment, part of an overall regulatory program, developing NPDES permits). Nineteen left this question blank. Forty-nine percent of the whole sample, even after including the blank responses, agree they are in an "environmental management" occupation even though, in answer to the question regarding degrees obtained, 44 degrees out of 66 reported were "hard sciences" (biology, chemistry) versus "soft science" (environmental engineering, environmental studies). That is, 66% of the background degrees in the sample were reported as in the "hard sciences," yet 49% of the sample identified their occupation not in terms of the hard science degree but in terms of a general "environmental manager" label. (See list of degrees held by the sample in Table 4). This suggests that a common occupational identity has emerged or is emerging. The focus of this identity, however, may involve a broader environmental focus for some in addition to those

who see their occupations as clean water management. The fact that the names given their larger occupation are not all directly related to water quality suggests that wastewater treatment roles specifically (for those in that section) and water quality roles generally, for all those in the division, represent partial emergence of this specific occupation. The implications of this conclusion are discussed at more length in Chapter 4. The actual occupation names given by respondents, the kinds of jobs included in this occupation, and the number of years the respondent has seen themselves in this occupation are given in Table 9, below.

Do mid-Michigan surface water workers "See their job as a profession like medicine or law?" Twenty-eight "agree," 8 "strongly agree," while 9 "disagree" and 3 "strongly disagree." The 36 total who agree or strongly agree are 77% of the sample, suggesting a "professional" identification.

Is the organization for which they work "An excellent place to pursue my occupational goals?" Twenty-four "agree," 10 "strongly agree," while 11 "disagree" and 2 "strongly disagree." The 34 who agree or agree or strongly agree are 70% of the sample, suggesting a link between occupational and organizational identification. Some of the comments from people who disagree included: "Excellent place for initial training, but I've felt limited by the inability to address issues through a broad perspective or 'big picture.'" This person, for example, sees the job as a profession but feels the DNR has its limits in enhancing professionalism. A few other commentators who answered "disagree" reported: "We do very little science," "Becoming a paper bureaucracy."

Do mid-Michigan surface water workers subscribe to or consult regularly issue-oriented, scientific-professional, or join occupational associations? If this number is high we could take this as evidence of consciousness of occupational identity, on the assumption that these activities are both products of and tend to produce a sense of being in a particular occupation. We reported on this in our discussion of Research

Table 9. Descriptions of work as part of a larger occupation, jobs included in this larger occupation, and years in this occupation given by mid-Michigan Surface Water Quality Division water quality workers.

Name of larger occupation	Jobs included in this larger occupation	Years in larger occupation
Management, Protection and Enhancement of Surface Water Resources of the State	- Basic research of issues, Field Biologist roles, NPDES permit development roles, program mgt. roles, community assistance roles	6-15
Environmental Policy Development and Analysis	- Review, research and develop env. policy by considering cost-effectiveness, economic impact, env. benefit of proposed programs or regulations, and seek out alternative technology and economic and social incentives for improving the environment	1-5
Environmentalism	- Permits, conservation, evaluation	1-5
Environmental Health Specialist	- Awareness of impacts and risks of several pollution impact modes, i.e., multi-media impacts - air, water, toxic materials	15+
Environmental Protection	- Soil scientists, env. d)., toxicologists, aquatic biologists	6-15
Part of an overall regulatory program	- Permit issuance, compliance/enforcement, stream monitoring	6-15
Protecting and enhancing the waters of the state	- Biologist (Fisheries & Aquatic) water quality analyst, technician	6-15
Surface Water Quality Protection	- Permitting, stream studies, compliance & enforcement, spill response (limited), operator training, facility construction	6-15
Environmental Chemist	- Utilizing a good math/computer background	(blank)
Clean water	- Too numerous to list	6-15
Wastewater Treatment	- Design & construction, operation and control, laboratory, maintenance, training technical assts., certificate, regulatory	15+

Table 9 (cont'd).

Protect Env. Resources Pollution Abatement	- Permitting discharges to air, land & water, hazardous waste disposal	1-5
Environmental Protection	- Attorney, project management, geologist	6-15
Environmental Protection Professional	- Env. educators, oceanographers, naturalists, sanitarians	1-5
Public Servant	- Protection of environmental quality for the citizens of the state	6-15
Environmental Manager	- (blank)	1-5
Toxicologist	- (blank)	(blank)
Socio-economic Environmentalist	- Statistical relationships, human resources/psychology, ecological/biological habitats, chemical/biological relationships	15+
Natural Resource Ecologist Aquatic Ecologist	- Water quality is a minor part of aquatic ecology and organizations with water quality as a prime focus still have the cart before the horse	15+
Caretaker of Waterways:	- same	6-15
Developing NPDES Permits	- Developing limits for toxicants, writing an NPDES permit, developing limits for conventional pollutants	6-15
Resource Protector	- Waste management, Environmental Response, Groundwater Protection	1-5
Freshwater Biologist	- Fisheries managers, habitat biologists, wetlands managers, water fowl biologist	1-5
Aquatic Biologist/ Toxicologist	- Regulatory positions, policy making positions, environmental assessment positions, environ- mental recommendation positions, toxicity testing positions, etc.	6-15
Environmental Engineer	- Permit writer (NPDES Permits)	1-5
Environmental Protection	- Air quality engr., WWT operator	1-5
Environmental Engineer	- Permit writer, plans review engineers, facilities inspection, compliance and enforcement, construction grant/loan program, etc.	15+

Table 9 (cont'd).

Environmental Professional	- (This applies to) most level IV (and up) in DNR divisions of Air, water, waste, env. response (clean ups), land & water mgt., consulting jobs, some lab. jobs, some health dept. positions (state & local), company env. mgrs.	15+
Surface Water Quality	- wastewater treatment engineers, toxicologists, aquatic biologists, permit writers, compliance and enforcement, etc.	(blank)

Question 7, where we asked if such subscriptions, memberships, or regular consulting was an indication of the build up of structural supports. We could also see such activity as a sign of common occupational identity. Do mid-Michigan clean water managers subscribe to or consult scientific-professional water related or general environmental journals regularly? We previously reported that 28 subscribe to one or more journals while 21 do not. Fifty-seven percent of the sample, then, do subscribe to one or more scientific-professional journals (see Table 5).

Do mid-Michigan clean water managers join work-related associations? Our survey research found 74% did not join any work-related organization other than (MPES) which many felt was a requirement of the job). Twenty percent of the sample had membership in two or more work-related or occupational organizations (See Table 6).

Do mid-Michigan clean water managers join issue-oriented environmental organizations or associations? Our survey research found 60% had joined one or more such organization. Some of the comments on the survey mentioned that for those who did not join such associations on major reason was their sense that "this would be a conflict of interest." Membership in these organizations may reflect general, environmental concerns rather than specifically occupational interests.

What do these results, (previously reported in Research Question 7 in our review of the build up of social structure), reveal about the

emergence of a common occupational identity? That more than half identify enough with their "environmental" occupational field to subscribe to a scientific-professional journal, that this identification with the occupation as an "environmental" occupation is strong enough that over half subscribe to or are a member of an issue-oriented environmental organization, but that the work-related association, interest group, professional division, or occupational organizational affiliation is low (under 20%).

Is there an age difference in this question of occupational identity (eg., between cohorts)? We examined responses for question 20 "I see my job as a profession like medicine or law," along an age difference. For those with 13 years or more in water quality work (senior worker generational first cohort, N = 20), 18 agreed or strongly agreed, while only 2 disagreed. Thus 90% of the generational first cohort see themselves in a profession ("like medicine or law"). The finding for the second cohort on this question was that 60% see themselves in a profession like medicine or law. Since so much of the knowledge is reported to be learned on-the-job, this may represent a job cohort finding more than a generational cohort finding - that is, the longer on the job the more professional knowledge and insight one has accumulated.

While the generational first cohort was about the same as the second in belonging to issue-oriented environmental associations and use of scientific-professional journals, they were much more likely to join work-related occupational associations or organizations. As a sub-sample 32% of the generational first cohort had joined such work-related occupational organizations in contrast to % for the second cohort.

Is there a difference between cohorts in how respondents ranked importance of environmental commitment, organizational identification, and professional concerns? If we take just a comparison of generational first cohort (13 years or more in water quality work) and a definition of "second cohort" as 5 years or less in water quality work, and we compare

the two job/age categories on just which of these three (movement, organizational, professional career) they ranked first, we find that the generational first cohort ranks commitment to professional career as "first" twice as often (N = 11) as commitment to organization (N = 5) or movement goals (N = 4), the latter two of which were distant second and third. On the other hand, the "second cohort" ranks environmental goals "first" (N = 10) and commitment to environmental management as a professional career a very close second (N = 9), with commitment to the DNR as work organization a distant third (N = 2).

In terms of consciousness of an occupational identity, these findings suggest both the generational first cohort and the "second cohort" have a much stronger commitment to environmental management as an "occupational" identity than to the DNR as a work organization, but that more recent entrants into the field had stronger environmental concerns. What did our intensive interviews reveal about occupational identity?

Intensive Interview Results

Interviews with senior worker, generational first cohort, key informants suggests that many clean water managers do not have a highly developed occupational/professional identification. That is, they identify with issue-oriented environmental organizations (but feel too much identification might be a "conflict of interest"), they keep up with job-related and general environmental scientific and professional journals (although very few subscribe to three or more, some read them only at work), but they are low in their activity with occupational groups, such as going to professional meetings, professional division memberships, scientific conferences, and so forth. There were some comments expressing an interest in doing this, but a lack of time on-the-job, and an unwillingness to do it "all on my own". On the other hand, several of the senior worker generational first cohort interviewed seemed frustrated with other clean water managers in this respect, and even hoped that this study

might stimulate their coworkers to "become more professional." What are we to make of this?

Basic considerations in understanding this pattern among clean water managers may include the following: 1) we are witnessing the carryover of the "engineering" side of "environmental engineering," which might bring with it the traditional low professional identification frequently cited in the literature as common to engineers, and a pattern of "low professional prestige" that was commented on by contributors to the sanitary engineering journals of the 1950s and 1960s. Engineers tend to be applied technologists and are weak on the kind of knowledge articulation of their work jurisdictions and political competition within a "system of professions" that Abbott (1988) comments on. 2) There is a confusion with such a broad work jurisdiction as "environmental manager" about how to focus on an occupational identity. This problem with "interdisciplinary" fields has been commented on by university program faculty (Dersch, 1990) and may be a broader problem of "program professionals" in other "mixed, new professions" (Wilensky, 1964). 3) The DNR and civil service employment generally puts impediments in the way of occupationalizing, rather than encouraging professionalization (eg., clean water managers may need work-based support structures such as "sabbaticals," leaves of absence, rewards for publishing, support to go to meetings, more on-site brown bag seminars, and so forth to expand the process of occupational identification. Our results show that the senior worker generational and job first cohorts have a stronger occupational identification than the younger sample respondents, and that there is some frustration among "first cohort" members on the issue, and a potential for leadership from them. On the other hand, the issue of the younger, "second cohort" incumbents is of interest, and may have a separate influence on the continued emergence of clean water management as an occupation.

Research Question #9: If there is a "second cohort" how does it relate to the occupationalizing process? (cohort effects)

Discussion

In the literature on occupational emergence the research reviewed has studied "first cohort" initial incumbents. These studies were aimed primarily at interpreting the emergence of an occupation, and only secondarily, if at all, toward the effects of any continuing social movement on occupational dynamics. Weber, in his reflections on the institutionalization of social movements into staff structures, also focused on the transition of original movement members into initial institutionalized staff positions, or legitimized work roles as labor market positions. Blum, et al (1988), in their study of the "occupational program coordinator" focused only on the origins effect period of the original "alcoholism as a disease" social movement. Ross (1975) was looking at the original community action movements of the late 1960s and early 1970s in his analysis of the "advocate planner." Hughes (1958) emphasized the role of social movements in originating new work. And Abbott (1988, 149) has briefly noted the role of social movements in the emergence of new professions into the system of professions, but has not followed up on that lead.

In these cases of the literature reviewed, there is no specific focus on what the effect might be of a continuing social movement on further dynamics in the ongoing emergence (or altering) of an occupation. One dimension of an ongoing social movement is that its continuation (or revitalization) into later historical phases may provide experiences in common (Mannheim, 1938) for a "second cohort" of incumbents in the emerging occupation. What might be the case for environmental management types of work? On what grounds might we hypothesize that a "second cohort" of incumbents is occurring?

In the continuing environmental social movement after the transition from mobilization and protests to legislation and litigation there was a

period of pressure to build up the support structures and group consciousness: university training and socialization programs in particular, but also professional association divisions, changes in work titles, and new publications, and the experiences of the initial incumbents in on-the-job learning. All of this occurred between 1972 and the mid-1980s. The hypothesis for a "second cohort" is that an interactive effect was occurring as these events coalesced into an emerging occupation - an interactive effect that began to affect the new recruits coming through the new university programs in environmental studies and entering the newly emerged clean water manager positions.

In particular, the "second cohort" would have been entering the university programs during the "revitalization" phase of the environmental movement's response to the Reagan administration's (1980-1986) counter-movement, or in the years immediately after the 1986 Clean Water Act, a period, especially by 1988/1989 and onward, in which there has been an important, continuing "global concern," revitalization of the environmental movement. The "first cohort" of initial incumbents would have been the guest speakers in the new environmental programs, transmitting "news from the front." These new programs, themselves only a few years old, would have been consolidating the dimensions of the new work jurisdiction into a more formalized training and socialization experience. One outcome would be that the "second cohort" graduating in the mid-to-late 1980s would, on the one hand, have a more "professional" outlook, and on the other hand, would be influenced by (and carry the movement goals of) the second, resistance/revitalization phase of the environmental movement. Educated in more focused programs, imbued with a more well-developed, possibly more coherent, occupational ideology, coming in contact with new labels, occupational associations, and publications all defining a "professional project" - socialized as "program professionals" in the historical context of the later phases of the environmental movement - this second cohort would move into the entry

level positions in clean water management in the mid to late 1980s and receive further on-the-job socialization from the first cohort, setting up yet another distinct age-related and job cohort interactive effect. What light can our study shed on this question?

Results

First, of the total of our Lansing based Surface Water Division respondents working directly with water quality, there is a somewhat bimodal distribution around eight years and more working in the division and seven years or less. However, there are reasons on substantive grounds, to be detailed presently, for dividing the cohorts at five years of work experience. The raw data showing the distribution of years worked is given in Table 10, below. In this distribution 29 are "first cohort" (59%), and 20 are "second cohort" (41%). Another way to "cut" the first cohort from the second would not be on the basis of years on the job but rather by age, e.g., 34 years of age or less. If we take age at 34 or less our second cohort would number 17. Largely this is an overlap with the distinction based on job cohort ($N = 20$). Therefore, we will not try to distinguish the "second cohort" in terms of age versus job experience.

Our study of the senior worker, first cohort generation has alerted us to the historic importance and role of initial incumbents, our major focus in this case study. However, it may be useful to also focus on the primarily younger, "second cohort." Are there research data and theoretical grounds to support this division?

One aspect that should be considered is the evolution of federal water policy. It could be argued that the period prior to the 1986 Water Act was a separate and distinct "origins effect" epoch (that is, the first cohort period of 1965 through the 1977 Clean Water Acts that set up the initial positions). The historic ten year period of these new positions (1977 to 1986) involved level funding at 75%, initial and repeated delegations, the milestones of both extending secondary treatment and

Table 10. Separating the "first cohorts" from the "second cohort": Modal distributions of how long mid-Michigan Surface Water Quality Division water quality workers have been in water quality jobs.

<u>Mode #1 - Six years or more</u>	<u>Mode #2 - Five years or less</u>
22	5
20	4
20	3
20	2 1/2
20	2
18	2
16	2
15 1/2	2
15	2
15	2
14	2
14	2
13 1/2	2
13	1/2
13	1/2
13	1
13	1
13	1
12	1
11	1
10	1
10	
9	
9	
8	
7	
7	
6	
6	
6	

initiating tertiary and trace toxin treatments, and many new studies and new university programs. All this was changed with the 1986 water legislation. After 1986 the funding dropped from 75% to 45%, with 5% state added, requiring communities to come up with 50% of the funds for further WWTP construction or remodeling. On the one hand, the program had been a success over its ten years, less federal funding was now needed. On the other, hand federal deficits and the "new federalism" of the Reagan years was shifting responsibilities to the states and the communities. From an environmental viewpoint the 1986 Water Act was a mixed message: there were cutbacks at the federal level that might adversely impact environmental protection, but also with lowered federal funding for WWTP construction there might be less incentives for overdevelopment that had been fueled by "easy" federal money for the expansion of WWTP works that such growth depended on as an infrastructure. Younger university students graduating shortly after this 1986 Water Act had been socialized to the new atmosphere of constricting federal budgets. Were there other impacts upon the new university trainees?

Another aspect of a potential "second cohort" is the perspective that as they experienced the new university programs they were being graduated into already existing positions - they were more "up to speed", requiring less on the job training than the first cohort, which had to learn it all, or most of it on the job. A third aspect of a potential "second cohort" is that while they may have experienced the "revitalization/resistance" early 1980s phase of the environmental movement in their youth, as young adults entering the environmental labor market, they were exposed to (and a part of) the most recent "second" revitalization of the environmental movement, which began around 1988 and has reached some point of tension, if not culmination, in the 1992 UN Conference on the Environment. During the period 1988 to 1992 much world concern surrounding the ozone layer, global warming, toxics, oil spills, nuclear plant disasters, the destruction of the rain forest, species

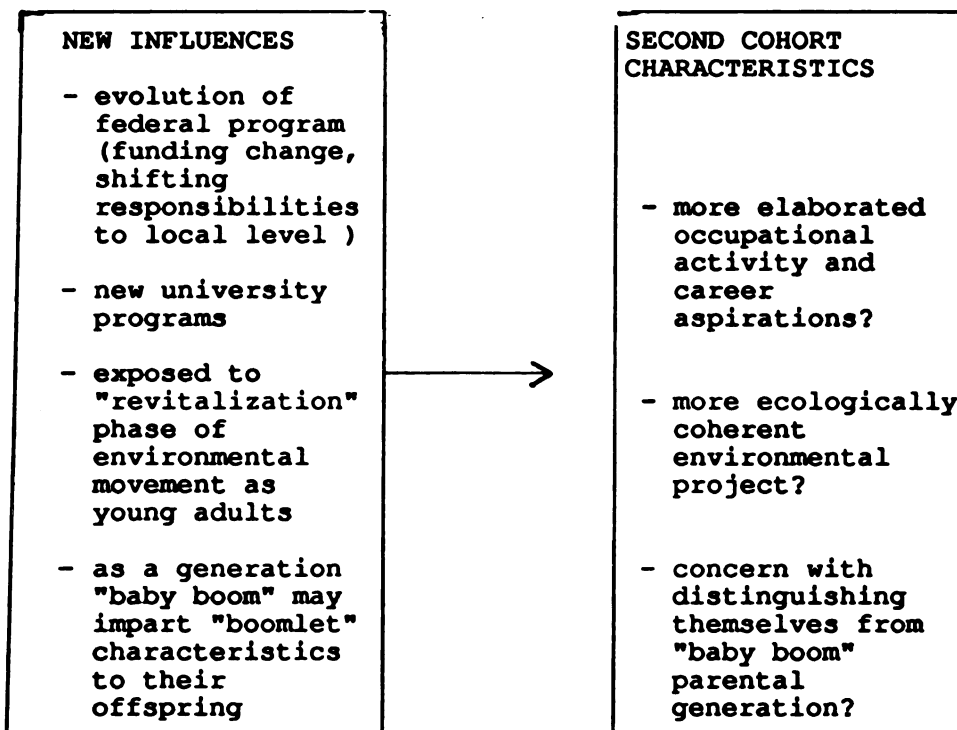
extinction, landfills, recycling and many environmentally related health concerns. All of these have accumulated to produce still another resurgence of environmental and ecological consciousness. At the same time a new (potential) generational cohort may be emerging from the newly professionalized, but now maturing, university programs. It would be hypothesized that this "second cohort" would be more professional, more "cosmopolitan", willing to work and locate anywhere, and guided more by internal occupational culture rather than by the more "local" experiences of the first cohort, who were, perhaps, guided more by organizational loyalty (Gouldner, 1959; Wilensky, 1964).

Finally, a fourth level, a demographic dimension, may be at work. People born in the late 1960s and early 1970s would be the historic "baby boom" parents first offspring. As a generation the "baby boom" may impart "boomlet" characteristics to their offspring which, when combined with recent environmental movement history, the university professional programs, and other changes, make for a distinct "second cohort" phenomenon. We might predict, for example, that the "second cohort" may want to distinguish themselves from both their "baby boom" parental generation and the first cohort of clean water managers in certain ways. This distinction might take the form of more elaborated occupational activity - that is, the "second cohort" may have a more professionalized, more mobile, and more ecologically "coherent" environmental project and career aspirations. If so, the problematic question of whether environmental managers have a clear career path may be of special interest to the second cohort who, looking to the concerns with this question held by the first cohort, may ask: "Can we improve on the career possibilities in water management"?

There are some data from the intensive interviews that this second cohort, coming through the now institutionalized/formalized programs, have a somewhat different perspective. Therefore we want to revise our general

causal model to include the possible separate influence of a second cohort and indicate this in the lines of influence depicted in Figure 14, shown below. What do the data in the Surface Water Division survey questionnaire reveal about this second cohort?

Figure 14. A second cohort (job and/or generational) may be emerging among mid-Michigan Surface Water Quality Division water quality workers.



Survey Results

Is the "second cohort" different? Our survey findings reveal that 60% of the second cohort, defined as 5 years or less in water quality work, indicated an ecological interest or "environmental" reason for going into their work. This was more than the generational first cohort (35%), who more often listed other types of reasons, such as job transfer, career opportunities, benefits or personal reasons. The second cohort had 15 "hard science" degrees (biology, chemistry) and 10 "soft science" degrees (environmental engineering, resource development), but on the other hand answered 9 to 1 that the occupation they were in was a "soft science" occupation, eg., environmental protection, resource protection, environmental engineering. This finding agrees strongly with the Blum (1988) findings that a common label occurs with the emergence of an occupation even though backgrounds in degrees were split between hard science and soft science. This is an interesting finding for hypothesis generation, but our N of 10 with 10 others who did not answer this question is too small to replicate the Blum study.

Nearly all, (N = 19), of the second cohort indicated their "present job related to their degree." This is higher than for the first cohort and may indicate the kind of build up of social structure discussed in research question #7.

In terms of "changes in the water quality related jobs" they had had, the second cohort often responded they could not comment because they were "too new on the job." However, those who did respond (N = 11), tended to rank technical/engineering and legal/regulatory/organizational types of knowledge as the type of knowledge with the most increase. The first generational cohort ranked all three about even.

Second cohort respondents had a higher membership in issue-oriented organizations and a lower membership in work-related or occupational organizations as compared with the first cohort. Sixty percent of them agreed they saw their job "as a profession like law or medicine" in

contrast to 90% of the generational first cohort. So their professional identification is much lower in terms of work-related or occupational organizational membership and in professional identification, but they are more clearly identifying themselves as "environmental" in the occupational label and in their issue-oriented memberships. This tendency to identify with (have more consciousness of) the environmental movement also shows up in their ranking on the question "If I had to rank the importance to me of environmental commitment, organizational identification, and professional concerns I would rank them as . . .". The comparison with the generational first cohort is shown in Table 11.

Reflections on the "Second Cohort"

The lead for thinking about a second cohort came in a graduate seminar in "Water Quality Institutions" taken in 1990 in a major mid-western state university resource development department. One of the seminar participants, who worked fulltime for the DNR, mentioned, after I had given a report on my research-to-date, that "There was a second cohort coming along, entering the positions now." Because the environmental movement is a continuing movement, and because it has gone through at

Table 11. Second cohort compared with generational first cohort on rankings of movement, organizational, and professional commitment among mid-Michigan Surface Water Quality Division water quality workers.

Commitment	Cohorts					
	Gen. 1st	2nd	Gen. 1st	2nd	Gen. 1st	2nd
Ranking	<u>1</u>		<u>2</u>		<u>3</u>	
environmental movement goals	4	10	7	4	9	6
DNR as my work organization	5	2	9	9	6	9
environmental management as a professional career	11	9	4	7	5	4

least two phases of revitalization (1981-83 Reagan-years, 1989-current global concern), there is sufficient historical change occurring to make tenable the hypothesis that the second cohort is not only a "job cohort", but a "generational cohort" as well. How the maturation of the second generational cohort interacts with the maturation of "environmental management" as an occupation, and how the second generational cohort interacts with the first generational cohort merits further study. Both cohorts are affected by the growth of knowledge, by increasing regulatory rules and procedures, by developments in the organizational networks (or organizational fields) they are a part of, and by changing water quality problems. How does this increasing complexity affect the direction of change in the position? To this question we now turn.

Research Question #10: How has the environmental movement affected the increasing complexity of the position? (Growth of knowledge, increasing regulatory rules and procedures, development of organizational fields, changing water quality problems, etc.).

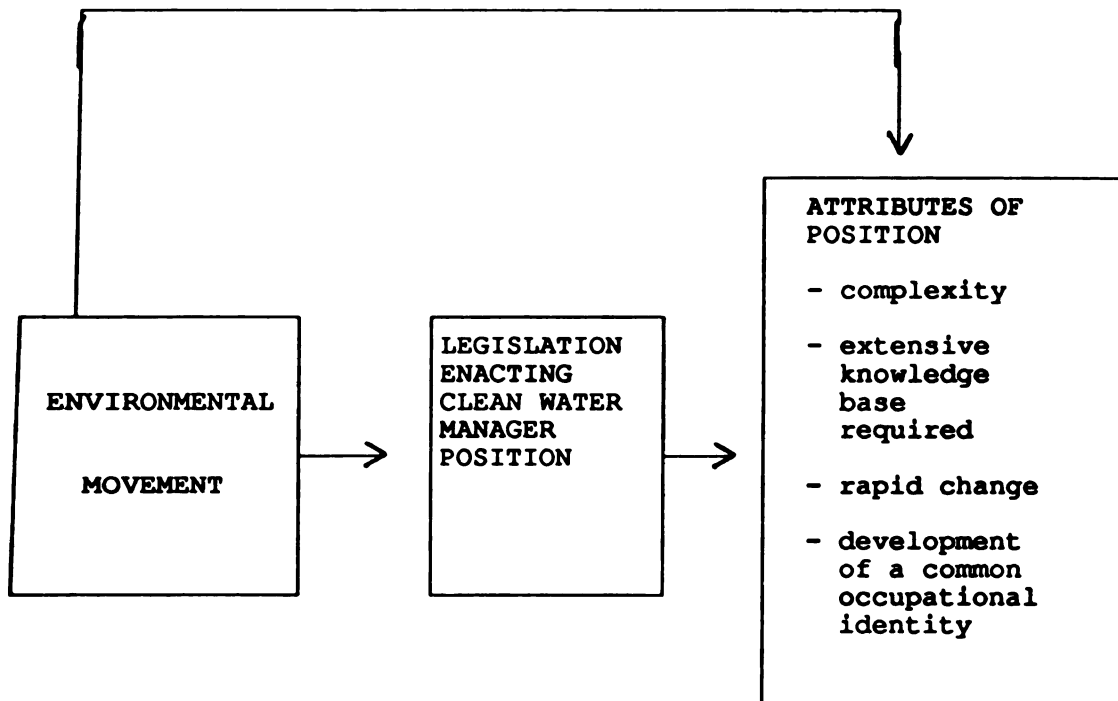
In our general causal model we hypothesized that the environmental movement would act to influence, in an "origins effect," legislation that would lead to the initial positions, and that the environmental movement would also act to influence the initial incumbents and have a continuing effect on the direction of change as the position becomes an occupation. However we did not hypothesize, in our original causal model (Figure 1, p. 22) that the environmental movement would have a direct and continuing influence on attributes of the initial position. We modify our initial model to reflect these lines of direct influence in Figure 15, shown below. It seems clear from our research and discussion so far that the environmental movement has had the effect of influencing the complexity of the position in terms of at least three attributes: 1) increased complexity of the emerging organizational field, 2) increased complexity of the expanding knowledge base required, and 3) increasing the rapidity

of change related directly and indirectly to the position. What general considerations of this complexity should be considered?

Schnaiberg (1980) has described the transition of environmental social movement organizations (SMOs) "from mobilization to power" in the environmental movement and he notes the nature of its changes in response to resistance. This changing nature of the environmental movement manifested itself at the occupational level too.

Origins in recent decades of water quality roles can be traced to initiating "white papers" (e.g., Lynton Caldwell who helped draft the 1965

Figure 15. Direct influences of environmental movement on attributes of the initial position.



law and the 1969 NEPA draft legislation, and others who contributed to the 1972 and 1977 Clean Water Acts, etc.) and to occupational associations and early liaison with universities. Water management institutions in general underwent a transition since the advent of the environmental movement from single media "conservation, quality and engineering" orientations with limited regulation, toward increasing "cross-media ecology" research, quality and cross-cutting "environmental management" duties. Recent interviews with faculty of resource development programs at the university level and DNR workers support this thesis. Our interviews and survey data, as discussed above, lend some credence to a shift in DNR job orientation during this period (1965-1991) from "engineering regulation" to "environmental management."

Wilensky emphasized that professionals have a "service orientation" - experts solve client's problems. As a service orientation the new "segment" ideology (Bucher, 1961) in this engineering-to-environmental shift emphasizes environmentalism rather than engineering. This was also borne out in our analysis of the "second cohort" who had a distinct image of their occupational identity as an "environmental" occupation (in contrast to a hard science field). The water management literature researched also lends weight to this thesis. References to "environmental management" vs. standard civil engineering as an occupational "technical service ideal" (Wilensky, 1964) abound. Our review of the ASCE - SED Journal from 1956 to 1972 verified this shift from "sanitary engineering" to "environmental engineering." What, in 1965, was an early call for clean water had become, by 1981, a distinct set of rapidly growing "environmentalist" roles: the clean water managers were on the march. Our point, however, is that this was to become a "march into increasing complexity", in contrast to the relatively simpler services provided by the earlier, straightforward primary treatment WWTP and general "sanitary engineer" water quality work. "Environmental engineering" became more complex. What does our survey reveal about the issue of complexity?

Survey Results

For the sample as a whole has there been an increase in complexity in the work of clean water managers? In answer to the question, "Does your present job relate to your degree?", the overwhelming majority answered "yes" (N = 43), but 11 respondents also indicated "yes and no", and their were comments such as: "My degree was less relevant but there are college programs now which address toxics and regulatory issues." Such comments indicate increasing complexity in the field of environmental management.

The complexity of the work and, especially, its rate of change is borne out by the fact that 85% (N = 42) reported "a great deal" or "almost all" of the skills and knowledge required for water quality related environmental management work was learned on the job - this despite the universal acquiring of one and often two or more university degrees in related hard and soft sciences.

Respondents generally felt that prior training was adequate or somewhat adequate (N = 37), however 60% reported additional formal training on the job. (This additional formal training is reported in detail in research question 7). So we can conclude that due to the amount of on-the-job training, and the frequency of additional formal training on the job, that environmental management work contains additional complexity and a rate of change that cannot be prepared for by academic degrees (or limited internships) alone. This interpretation is additionally borne out in the three parts of question 9 ("How strongly do you feel that specialized academic training prior to entering the work, continuing education on or off the job, and attendance at meetings of professional associations . . . are needed?"). On the one hand, 41 respondents felt more specialized academic training prior to entering the work was either "not needed" (N = 11) or only "somewhat more needed" (N = 30), with only 7 feeling such additional specialized training was "much needed" and no one reporting it was "very much needed." On the other hand, 25 reported

continuing education on or off the job was "much needed" or "very much needed."

Additional training due to the complexity and change in the work appears to be the type of educational need that benefits more from on-the-job and on or off the job continuing education rather than by additional formal academic training. Even though very few mid-Michigan clean water managers join work-related, professional or occupational associations, 84% (N = 41) report that "attendance at meetings of professional associations" are "somewhat," (N = 15), "much" (N = 15), or "very much" (N = 9), needed. These responses on academic training, continuing education, and professional association meetings attendance are an indication of increased complexity in the sense of growth of knowledge. Our review of the SED Journal showed growth of knowledge and associated increase in complexity during the transition period of 1956-1972 from "sanitary engineer" to "environmental engineer." For the clean water manager of the 1990s these trends appear to be continuing.

Overall, 79% of the sample reported a "large increase" or "somewhat of an increase" in types of knowledge required, with an increase in environmental/ecological, legal/regulatory/organizational, and technical/engineering types of knowledge all ranked as increasing about the same amount. Complexity has also grown over the work span of 72% of the respondents in terms of increased paperwork. Complexity has increased for 56% of the respondents who report a "large increase" or "some increase" in amount of contact with external lobbies and/or pressure groups.

If we look again at the data on question 11, which asks about "other kinds of changes perceived in the nature of your water quality related job(s) over recent years," we get many indications of the specific types of complexity. This list was presented in Table 3, in our discussion of research question 4. Many of these comments emphasized that the job was becoming "more complex," "more public involvement," "changing federal

programs and laws," "increasing knowledge," (eg., toxics, non-point source), "new computer modeling," "changing political climate," "increased legal complexity," and so forth.

A small part of the increasing complexity can be attributed to personal maturity, maturity on the job, and program maturity, as represented by the quote: "As I get more deeply involved in the new stream water permitting program, and as that program matures, there are often contacts with sections responsible for carrying out related regulations, because storm water runoff comes from so many sources." On the other hand, this quote is also representative of maturing programs that may involve new levels of cross-media and multi-source runoff, or other similar hydrological phenomena, which are adding to the complexity of clean water management work over time. So this is not just an individual (or job maturity within a stable work site) type of variable, but rather a dynamic variable.

The list of changes over time in types and complexity of contacts was given in List 8 and List 9, discussed in research question 7. Forty-five respondents (89%) had indicated some amount or a large amount of contact outside their section; 46 (91%) indicated these contacts were directly required by their job; and 20 (41%) had indicated these contacts had increased. This response on increasing, outside-of-section, contacts indicates increasing complexity in the clean water manager's work. Types of changes specific to these contacts included explanations such as the quote in the paragraph above (about getting more deeply involved) and the attributes of increasing complexity (as programs mature). Other quotes included: "more interagency contact," "more public/private contacts," "more coordination with other divisions," "more complex problems, eg., non-point sources, require more contacts." Respondents overwhelmingly confirmed that 70% or more of these work-related contacts were required by the job (rather than as a consequence of individual initiative alone). Again, in terms of increasing complexity of contacts we are not

encountering an individual level variable, but rather a phenomenon directly related to the changing, more complex nature, of the job, which we hypothesize is due not only to the initial attributes (and founding legislation) alone, but also to the direct influence of the environmental movement.

In our introduction to this section we emphasized that the "environmental movement may be seen to have transformed water quality organizational activity from a relatively 'closed rational' to an 'open natural' (work) environment." "Open natural" models include ongoing organizing, and negotiated order, models on the social-psychological level; and resource dependence, institutional theory, and organizational learning on the ecological level (Scott, 1987, 105-115). One of the consequences on the structural level is that open-natural influenced occupations may be in a more dynamic, job-design process (Cardy & Dobbins, 1992). Does, for example, the increasing structural complexity of work-related contacts beyond the section "influence the development or the nature of your job or occupation?" (This was our survey question #18). Sixty-nine percent (N = 34) answered to "some extent" or "to a large extent." Our review of the SED Journal for the years 1956-1972 indicated a transition in job design toward more complexity as a consequence of both imminent developments (knowledge increase, academic trends), work-site complexity (suburbanization, growth, garbage disposers, detergents, etc.) and, most important, the influence of the 1960s and early 1970s environmental movement (eg., influencing the 1965, 1969, 1972 and 1977 clean water laws and program initiatives). What have been the recent sources of complexity as a direction of change? Some of the respondent quotes on "the nature of influence over time" of increasing contacts include that it helps them "become more aware" of: the damage done to the environment, others' perspectives, the viewpoints of the regulated communities, and strategies in other states or nations. The list of quotes

on the nature of influence over time of increasing contacts was given in List 10.

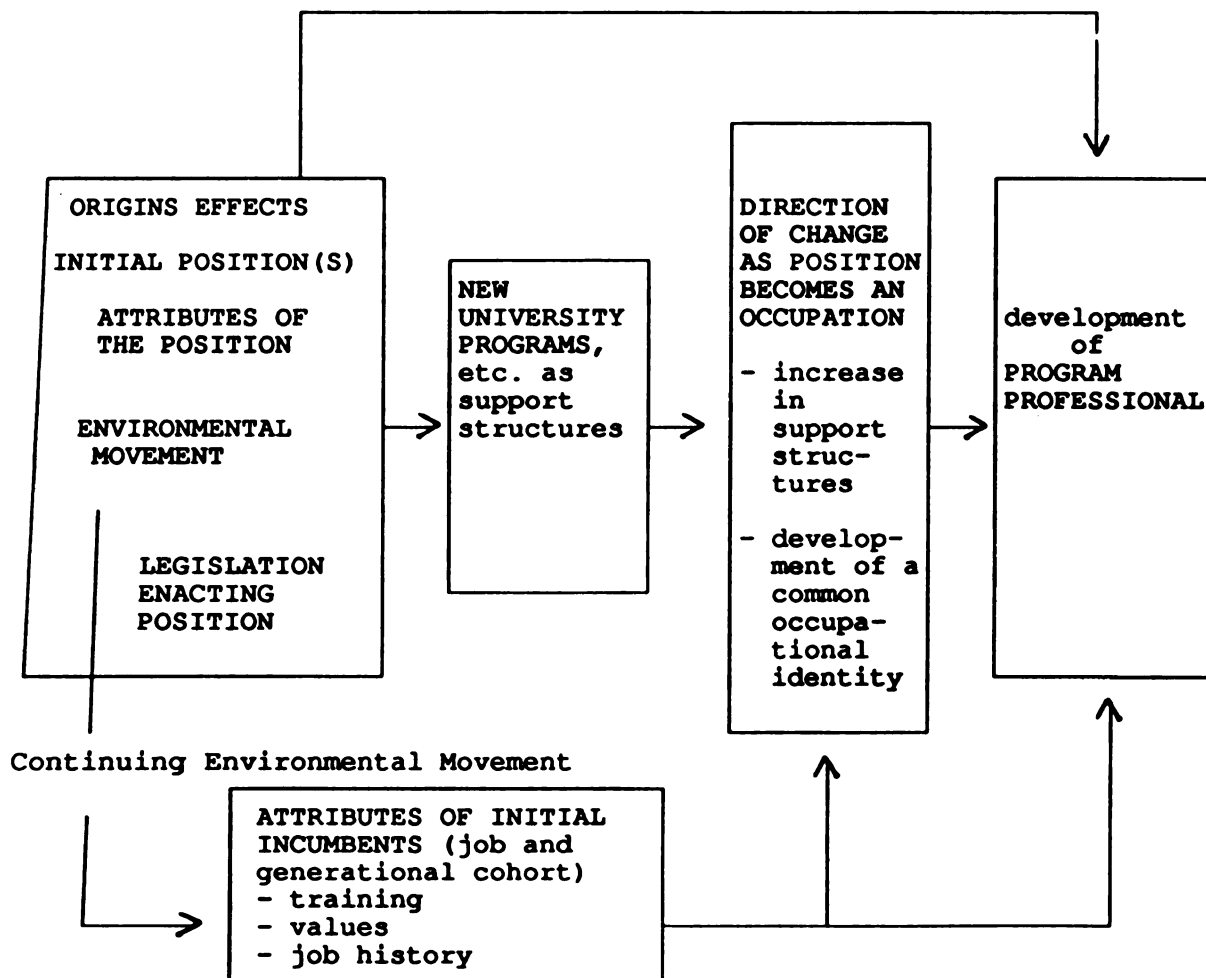
However, in addition to increased "awareness" (which may indirectly contribute to occupational identity), there are also quotes indicating "without these contacts it is difficult to make any impact on the aquatic resource" (eg., reports from those who were working on cross-divisional projects, such as stream improvement, non-point source runoff, or interagency/EPA based data systems). These latter work-related increases in outside-of-section contacts feeds back to the university programs, emphasizing more formal theory and training in cross-media, cross-division, more "environmental" and communication skills. It may also increase occupational identity around the environmental movement goal of "comprehensive planning." Still, there are problems of an orderly career for the environmental movement "program professional." To some of these questions we now turn.

Research Question #11: To what extent has the position developed the characteristics of Wilensky's "new mixed profession" or "program professional"?

Wilensky (1964) observed that the "new, mixed professional" - the newly emerging expert roles that mixed movement goals, organizational commitment, and professional careerism - would be "persons of culture and persons of politics." We modify our original causal model to include, as an outcome of origins effects, continuing environmental movement effects, and the direction of change in the position toward an occupation, the "program professional" as representing the direction of change in the position. This is depicted in the lines of influence in Figure 16, shown below. To what extent is this true of mid-Michigan clean water managers?

To what extent does the development of a common occupational identity among clean water managers take the "mixed new professional" form of the program professional? It is possible that senior worker first cohort and younger second cohort incumbents may be influenced by any one or two of these three "poles", eg., may be movement and organizationally

Figure 16. Lines of influence and interactive effects related to the hypothesis of the emergence of "program professionals" among mid-Michigan Surface Water Division water quality workers.



influenced but not professional, or professional and organizational, but not movement influenced, etc. We wish to develop a sub-hypothesis regarding "direction of change as position becomes an occupation" in our expected causal model to make room for the possibility that Wilensky was right in predicting these new professions would combine all three - the organizational, the movement, and the professional components. This "new resolution" would include an orientation in which some incumbent organizational staff would become expert in programs and also have a missionary orientation toward realizing movement goals through policy, leading to the development of "policy staff experts."

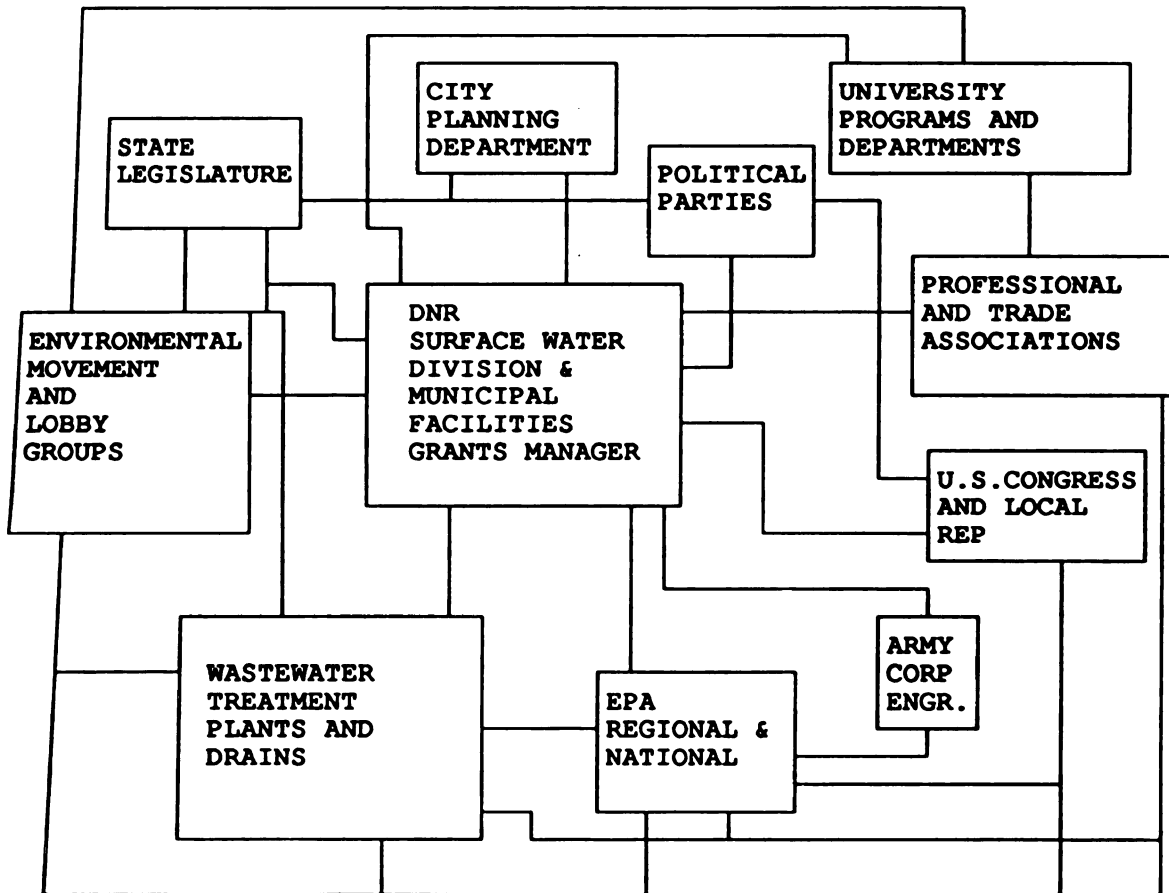
Findings related to this issue have been discussed throughout this chapter. An additional part of the answer to this question involves the degree to which contextual effects such as the intervening 20 year history and the emerging organizational field have influenced the direction of change in the clean water manager role as the position has become an occupation (contextual and structural effect).

Many interviews, internal documents, interview summaries of sector members, training manuals for consultants, documents regarding plants, city planning departments, EPA, legislators, Army Corps of Engineers, and relevant sector publications would be required to do a fullscale study of the "program professional" in the clean water management organizational

field. Some of these data have been consulted. We can summarize here by noting several features.

The Michigan WWTP "sector" or network population looks like Figure 17, shown below. (See Perrow, 1986, p. 178-217, for a discussion of environmental networks). Obviously the local Michigan wastewater treatment plant grants process network includes many national and regional agencies (including the parts of these organizations that interact with the Michigan network) as well as local social units.

Figure 17. Michigan wastewater treatment plant and drain "societal sector" or organizational field.



The rise of the new federal model of the 1960s helped create an increase in vertical, extra-local networks with "sectoralized" federal programs having centralized funding. The circumstances of this type of centralization appear to have involved distinct types of organizing processes (Scott, 1983). While calling for more study of vertical sectors, Scott and Meyers' (1983) research program has so far appeared to focus on the consequences of verticality (Asilomar, 1992) but has led to insufficient analysis of the processes leading to (and maintaining) the "verticality" involved.

How does a vertical sector grow? The environmental organizations and occupations have often emerged not from autonomous professionalizing of individuals and groups but within such a vertical sector at the organizational level, so the question is germane to our case-study. In what way is the emerging organizational field relevant to occupationalness? To understand the emergence of an occupation that is linked to the emergence of a new sector, we must look at the innovation and stable maintenance of the rising organizational field (societal sector) itself as an organizational part of the occupational story. Did this emerging organizational field create jobs without significant group consciousness or build-up of social structure? Or did the emerging organizational field create occupations resembling the program professional?

We have noted how the environmental management occupations in our case study are new, hybrid occupations of water management (Dersch, 1990) emerging as "semiprofessions" in the public bureaucracies of environmental management. Institutionalized by social movements, these new occupations interact within the emerging organizational "field." Even though our sample is limited to certain aspects of the Michigan WWTP emerging organizational field, we hope our case study may reflect generalizable findings about the questions of emerging organizational fields, especially in focusing upon the conditions for "occupationalness" in such fields. Of

course, such occupations as do emerge with social movement influenced emerging organizational fields may well involve, over time, one or more generational cohorts. Such phenomena create variable contexts and conditions for the development of the program professional, and we hope our case study has made a contribution to this question.

In the intensive interviews sample questions were asked that brought out differences in personal philosophy, as to whether persons identified themselves as "professional" based on an individual philosophy, e.g., ecologist versus engineer. People looking at developments of other professions (law, medicine) may be engaged in a mimetic effect: how to be like them? This may be a type of "mimetic strain" in an emerging occupation like clean water management which has a strong knowledge base, similar concerns, and lengthening formal training and socialization. Yet the traditional professions of medicine and law typically do not have the "new, mixed form" of the combination of social movement as well as organizational and professional goals - the program professional. Could there also be a "mimetic effect" of environmental managers looking at other program professional types of work, like labor movement roles? We may conclude by quoting, again, one of the interviewees, on the shift from engineering to environmental concerns, for this seems to be the clue to the persistence of the "program professional" orientation in clean water work. He said,

There are three groups in the DNR: planners, engineers, and biologists. It used to be that the engineers controlled things. Now it is more equal.

What can results from our survey contribute to the question of the development of program professionals in water quality work? To this question we now turn.

Results

The notion of the program professional emphasizes an occupational orientation in which professional goals and organizational goals are blended with and driven by social movement goals. Do the survey results

provide evidence for the development of such a "new, mixed form" of professionalism among mid-Michigan Surface Water Division water quality workers? Previously reported findings bearing specifically on this question are summarized below.

Some attitudinal evidence for the development of a program professional orientation is given in the respondents answers to the question which asked "What made you decide to apply for this work?" While it might be expected that such an open-ended and vague question could produce primarily practical, personal or organizational answers (e.g., "local job, "stable job," "promotion," or "transfer," etc.) or narrowly professional or vague occupational answers ("fit my training and education," "challenging," etc.), in fact 39% of the respondents answered with social movement or social movement-influenced goal statements such as "concerns about water pollution in general," "interest in field of environmental protection," "interest in water pollution control," "want to do something to impact the resources of the state in a direct manner." This is evidence that the mission orientation appears to be important.

The survey evidence on growth of knowledge and growth of external contacts lends support to the behavioral dimension in the development of program professionals. For example, all of the respondents agree there has been an increase in environmental and ecological knowledge. This presumably means that, in general, in work behavior, mid-Michigan Surface Water Division water quality workers pay increasing attention to growing knowledge that is closely connected to the mission-oriented base. The mission goals may direct them to this knowledge, and the professional and organizational obligations will require them to deal with the new knowledge, but it is the mission orientation based in the continuing social movement that appears to also be relevant. Fifty-six percent of the respondents indicated an increase in contact with external environmental lobbies and pressure groups. While this is not direct evidence of a mission orientation the fact that 39% of the respondents give

environmental movement-influenced reasons for applying for this work would suggest that such increases in contact may, in general, reinforce the mission orientation.

In response to the question "What other kinds of changes do you perceive . . .," many noted an increase in public participation, in public knowledge of environmental matters, and in their own need to be more expert and knowledgeable in their interaction with the regulated community and the public. To a certain extent this may reflect organizational obligations and professional developments for role incumbents, but clearly the public knowledgeability would seem to represent the influence of the continuing environmental movement - which, in turn, is having an influence on changes in the role incumbent's work. To the extent that increasing public participation represents a movement-influenced change, this change may reinforce the mission orientation of water quality workers, helping to maintain the development of the program professional.

If increases in environmental knowledge, in contacts with environmental lobbies, and in public participation represent a social movement influence, is this mission base reflected in the associations and reading behavior of our respondents? Sixty percent of respondents are currently members of one or more issue-oriented environmental organization or association, and presumably read or consult the magazines, newsletters, bulletins, and journals published by these organizations. In our interpretation of this finding we noted the civil service atmosphere of neutrality and the sensitive regulatory job many respondents have. Under these work conditions this degree of association might be significant, indicating a mission orientation characteristic of program professionals.

Do mid-Michigan water quality workers identify themselves as in an occupation that is social movement oriented? Some social movements may generate occupational labels for their emerging positions that are relatively low-key or neutral. Blum and associates' study (1988) of the "occupational program coordinator" examples this case. In such

circumstances, even though the occupation emerges in part from social movement influences, the common occupational identity that develops may not carry, either in its occupational label or in its occupational ethos, as strong a social movement orientation. In contrast, other social movement influenced program professionals may have a stronger, continuing social movement orientation. For example, this may have been the case for the "advocate planner" studied by Ross (1975). How do our survey respondents describe their occupation? Forty-nine percent of our survey respondents described their occupation as "environmental protection," "environmental management," and similar mission-oriented identities. At the very least such occupational labels serve as fairly strong reminders of the social movement influence, and may be especially important for the issue of program professionals in the cases where revitalization phases of the movement are prominent.

Do contacts not directly required by the job indicate a new, mixed professional orientation? In answer to the question regarding "work-related contacts not directly required by your job . . .," type of contacts indicated included 44% "common professional interest," 27% were "a result of participation in environmental organizations" or "due to community, civic, or other volunteer participation," and 22% was "intended to improve job performance," with 7% "other." This seems to be evidence of a "new, mixed profession." The 27% of work related contacts not directly required by the job that are a result of participation in environmental organizations or community, and other, civic participation is an indication of a mission orientation suggesting that the development of a program professional orientation is a tenable hypothesis.

Why are mid-Michigan Surface Water Division water quality workers in their present line of work? In answer to the survey question "The main reason I am in my present line of work is because of my commitment to environmental goals," 83% agreed or strongly agreed. Would survey respondents consider no longer working for the DNR Division if it didn't

meet environmental goals? In answer to the question "I would continue to work for my present organization even if it did not fulfill my goals for the environment," 39% disagreed. These survey responses are evidence that in addition to organizational and professional orientations, our sample has a strong mission orientation to environmental movement goals.

If mid-Michigan Surface Water Division water quality workers have a "new, mixed professional" orientation, how strong is the social movement commitment compared to organizational and professional interests? In answer to the question "If I had to rank the importance to me of environmental commitment, organizational identification, and professional concerns, I would rank them as . . .," the survey respondents ranked "commitment to environmental management as a professional career" as first, "commitment to environmental movement goals" as second, and "commitment to the DNR as my work organization" as third. This finding suggests that mission-oriented goals are an important part of the mix, and that there is evidence for the development in this occupation of the program professional.

In summary, can we conclude that clean water management is a type of work in which a program professional component has developed? Our participant observation, action research, and intensive interviews all provided examples of, or evidence for, an origins effect and a continuing influence of the environmental movement on our sample. All survey respondents indicated that their jobs entailed an increase in environmental and ecological knowledge and 56% indicated an increase in contact with external environmental lobbies and pressure groups. These phenomena may increase the mission orientation, especially in the context of a continuing environmental movement and given the reports of increasing contact with a knowledgeable and active public. Sixty percent of survey respondents are members of one or more issue-oriented environmental associations. A strong, social movement influenced occupational label, such as "environmental protection" or "environmental management," is a

self-identification for 49% of the respondents. One-fourth of the respondents reported work-related contacts not required by the job were resulting from participation in environmental organizations or civic participation. Eighty-three percent agreed they were in their present line of work because of commitment to environmental goals. Our data support the hypothesis that clean water manager roles include a program professional component.

PART V: SUMMARY OF FINDINGS

This case study presented a natural history addressing a specific set of research questions about clean water managers generated from a general sequence of events model: emergence of the role, initial definitions of the role, and occupationalizing of the role.

In tracing the emergence of the role we reviewed how the environmental movement exerted pressure at state and federal levels to improve water quality and how legislation established water quality programs. We gave an account of the evolution of U.S. water policy, and traced the changes in the pre-existing position of "sanitary engineering," and described the clean water manager position as it developed in recent decades in the Michigan Department of Natural Resources. These developments were also set in their context of an emerging organizational field - a new, federal model, regulatory network - in which the grants program (and other) clean water manager roles play a key linking role.

Specific data for three research questions included reports on how the environmental movement influenced the emergence of the position and the characteristics of the initial incumbents (movement effect, institutionalization effect, origins effect, cohort effect), and the degree to which the position and characteristics of the initial incumbents affected the environmental movement (interactive effect).

Our review of the initial definitions of the role included job descriptions and reports on an organizational development project, and data from intensive interviews on the structural characteristics and location in the authority structure. Attributes and job histories of the initial role incumbents were assembled from interviews and survey data. Some interplay of individual and organizational influences on the initial definition of the role were indicated, and reports on early conflicts, issues, and problems given in the interviews were presented and linked to the origins effect of the role.

Specific data for three research questions included reports on how the initial definition of the position (e.g., knowledge, complexity, rapid change), and characteristics of initial role incumbents affected subsequent developments of the position (origins effect, cohort effect), and whether there were continuing influences of the environmental movement on subsequent development of the position (continuing movement effect).

Our central focus on the occupationalizing of the role included evidence from the organizational development project, documentary, interview, and survey data reports on pressures for greater autonomy. We traced the emergence of more standardized career patterns (new university programs), and the emergence of training programs (increases in on-the-job training). We noted the persistence of unclear career paths, and the low membership pattern in occupational or work-related organizations. The emergence of additional support structures (professional organizations, journals, and credentialing) was documented. Questions regarding the extent of a new, mixed form of professionalism - the program professional orientation - were presented and we raised issues of the nature of the interplay between the build up of social structure and the development of shared occupational identity in clean water manager roles.

Specific data for five research questions included reports on the structural supports that have developed for the position and the degree and type of consciousness of occupational identity that has emerged,

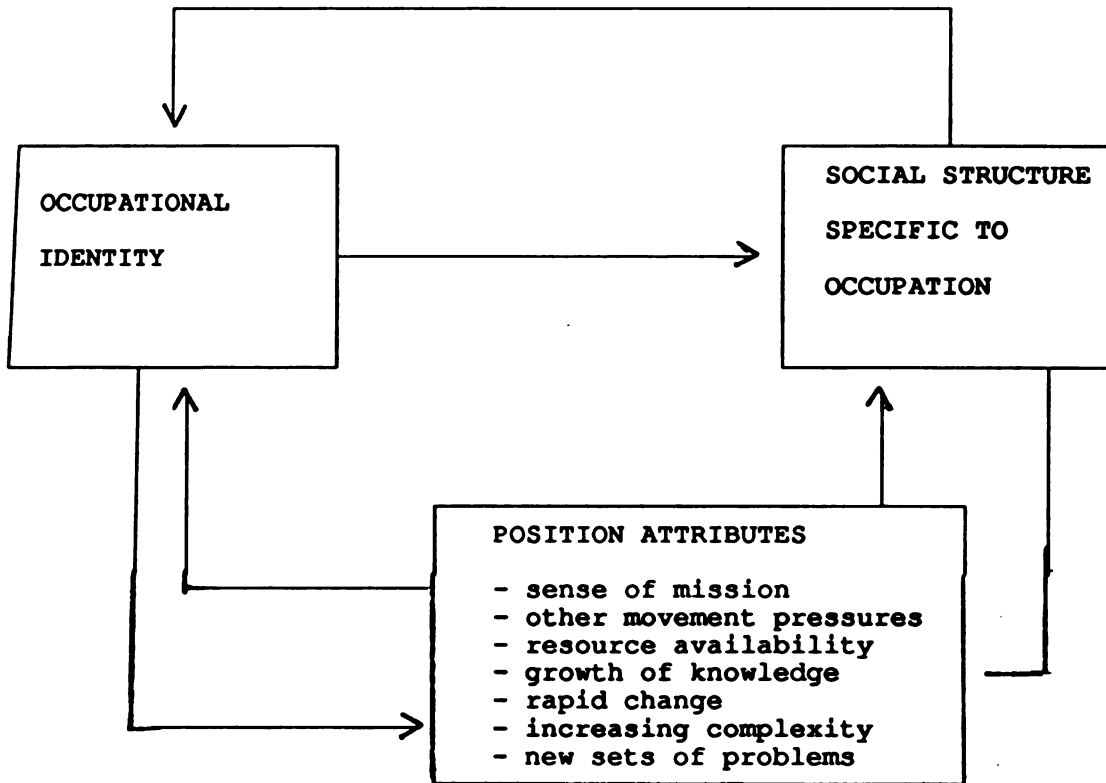
whether there is a "second cohort" and how it relates to the occupationalizing process, how the environmental movement affects the increasing complexity of the position, and the extent to which the position developed the characteristics of Wilensky's (1964) "new, mixed professional" or "program professional."

Interplay of Social Structure and Occupational Identity

An occupation can be said to have emerged partly due to the build up of social structure, for example, a professional or occupational association. However, the particular professional association exists partly because enough people see themselves as having that particular occupational identity. This suggests a reciprocal, reinforcing process involving occupational identity and social structure leading to occupational emergence. For example, among clean water managers, an identification of self in terms of a specific occupational label, specific body of knowledge, and specific set of problems and a strong sense of mission from the environmental movement leads to more social structure, which, in turn, leads to more occupational identity, which leads to more occupational structure emergence. These reciprocal relations, as influenced by specific moderating dimensions of clean water work, are shown in Figure 18.

However, our case study suggests partial occupationalizing represented by the fact that journal subscription and association memberships are mostly not primarily related to clean water management - they are mostly broader (as in "environmental") or, in a few cases, narrower (as in "hard science") - this may account in part for why mid-Michigan Surface Water Division water quality workers don't more actively participate in work-related associations or read more journals. Also, training at the universities (in terms of types of either broad resource or environmental degrees, or narrow, hard science degrees) is not specifically water management. For many of the clean water management

Figure 18. Model of occupational emergence as the reciprocally reinforcing interplay of occupational identity and social structure as moderated by specific clean water manager situational dimensions.



jobs, on-the-job training is needed exactly for this reason. Other reasons for on-the-job training include rapid change and growth of knowledge.

In summary, our case study describes results showing partial emergence of an occupation. It may be that the transition from "sanitary engineer" to wastewater treatment clean water management work has developed a stronger occupational identity through build up of specific wastewater treatment social structure. For example, this interplay of social structure and occupational identity has involved the move from undergraduate to graduate programs, the addition of environmental impact statements and comprehensive planning in the new environmental grants programs, complexity, knowledge growth, rapid changes, and the addition of new problems. The activities of water quality workers in other sections of the MDNR Surface Water Division may also have involved specific interplay of occupational identity and build up of social structure. Such reciprocally reinforcing processes involving occupational identity and social structure may eventually lead to a more clearly delineated occupation.

What kinds of substantive conclusions can we make from this case study? What are the implications of our findings in terms of theoretical considerations? What substantive gaps have been filled by this study and what gaps remain to be filled. What kinds of further research are suggested by this study? What are the applied implications for this type of work, for our sample, at this location, at this time? To these questions we now turn.

CHAPTER 4

CONCLUSIONS

Introduction

The overall objective of the study has been to describe the events from development of the clean water manager role to present characteristics of the role in order to develop hypotheses explaining these events. In order to do this eleven research questions were developed. The theoretical arguments underlying the research question variables were discussed in Chapter 2. General hypotheses were suggested premised on a tentative causal model (p. 22) presented in Chapter 1. These examples of expected findings included: that the environmental movement played a significant role in the characteristics of the position, that the initial cohort had a strong identification with the social movement, that complexity and uncertainty (due to rapid change, knowledge growth, new problems, etc.) would pressure for professionalization, that recent entrants into this role might have a clearer occupational identity, that, on the one hand, there would be a continuing influence of the environmental movement on the direction of change (e.g., training), but that, on the other hand, as the various aspects of the role institutionalized over time there would be less direct influence of the environmental movement, signifying more complete "occupationalizing" of the position.

In Chapter 3 we traced the emergence of the role, reviewed U.S. water policy, and placed the emerging positions in their organizational field context, looking at both the characteristics of the positions and the initial incumbents, and the interactions with the environmental

movement. We then reviewed the initial definitions of the role, the attributes and job histories of the initial incumbents, identified early issues and conflicts, and traced the "origins effect" for the emerging role. Our central focus on the occupationalizing of the role included a review of the emergence of new university and training programs, helping to standardize career patterns, but we noted the persistence of unclear career paths, and the low membership pattern in occupational or work-related organizations. There has been, however, the emergence of new support structures (environmental organizations, journals, credentialing) and we presented evidence for the development of a new, mixed form of professionalism in the role of clean water manager, a form combining elements of movement, organizational, and professional orientations - the program professional.

As we have traced this history we have asked about the interplay between social structure and occupational identity. Reciprocally reinforcing processes involving occupational identity, which our study suggests have developed around broad "environmental manager" consciousness, may lead to more specific social structure in the area of water management. If so, this additional social structure could, in turn, lead the current partial emergence of water quality work-as-an-occupation toward a more articulated clean water management occupation. Such "occupationalizing", it is hypothesized, is suggested by the effect of specific moderating variables in clean water work, such as: strong sense of mission, other movement pressures, resource availability, knowledge growth, rapid change, complexity and continually emerging new sets of problems. (See Figure 18, p. 331).

The plan of this chapter is to review the general theoretical contribution of the study. We also indicate gaps yet to be filled. The substantive research contribution is summarized. Again, specific gaps to yet to be filled are indicated. We then raise some of the theoretical

implications of our contribution. In addition, we present some applied implications of this study.

General Theoretical Contribution of the Study

There have been few studies in sociology of the emergence of occupations. The dissertation makes a contribution of a case study to an understudied area in the literature.

A substantial case study has been accomplished through presentation of documentary historical research, the initiation and findings of an organizational development project, intensive interviews from key informants, and results of a mailed survey questionnaire. The dissertation not only assembled a substantive case study, but adds, in a modest way, new survey data on conditions of work and attitudes of mid-Michigan Surface Water Division water quality workers. The dissertation reports a case study and makes an empirical contribution to the data in the sociology of work.

The dissertation reviews important theoretical questions in the sociology of occupations, brings several theoretical perspectives to bear on the emergence of an occupation, and presents a research design that is guided by a focus on theoretical concerns. By doing this the study attends to the current state of the literature. The dissertation makes a theoretical contribution by focusing elements of current literature and previous studies of the emergence of occupations on a new case study.

Scope and uniqueness of the contribution

The dissertation presents a study of an especially underresearched type of occupational emergence - the case of the institutionalization of a social movement. A specific focus is on bodies of literature relevant to the emergence of an occupation as the institutionalization of a social movement. These literatures are drawn together in a focused way in an extended theoretical review which presents some original attempts at synthesis relevant to the case study research design. The dissertation

makes the contribution of a theoretical review and some original theoretical perspectives to an underresearched type of occupational emergence - the case of occupational emergence as the institutionalization of a social movement.

Occupationalizing can happen in any sector of work, in any organization or sphere of the economy. Defined as the build up of social structure and group consciousness around a labor market position, 'occupationalness' can vary in myriad ways. The model of reciprocally reinforcing processes where social structure may lead to further build up of occupational identity which may, in turn, lead to further build up of social structure is not unique to specifically social movement influenced occupational emergence.

However, when any specific historical case of the emergence of occupationalness is examined it is clear that many moderating variables may influence that specific occupationalizing process. We have shown this for the case of clean water management. Generalizing from our case study, our argument is that social movement influenced cases of occupational emergence share several distinct moderating variables as general features not usually present in other types of occupational emergence. Some of these general moderating variables include: strength of social movement goals as 'sense of mission' in incumbents; other movement pressures including revitalization phases; degree of resources available due to social movement pressures and social problem processes; degree of complexity related to social movement ancillary and counter roles and the impact of counter movements; social movement (i.e., non-immanent) influences on the growth of knowledge; and the potential for rapid change and new sets of problems deriving from internal social movement influenced origins effects.

It is the influence and importance of these intervening variables which set apart, in general, the case of occupational emergence as the institutionalization of a social movement from other types of non-movement

occupational emergence. The scope of the theory is 'middle-range': it applies to cases of social movement influenced occupational emergence. Is there, however, an empirical uniqueness of social movement institutionalized occupations that suggests a more general societal level theoretical argument? For example, is there a special tendency for PISMO processes to occur in the public sector or to evolve into a public sector phenomenon?

Another way to put this question is to ask if the interplay of occupational social structure and occupational identity resulting from social movement influences necessarily sets in motion a contextual process producing public sector occupations? That is, while a PISMO process is occurring, it may be the case that there is more happening than an "internal rational" occupational process. Is there a tendency for such PISMO processes to manifest themselves as, or become, primarily public sector rather than private sector phenomena?

Can there be a private sector movement institutionalization of a new occupation? Are the PISMO moderating variables in evidence in the private sector? The answer is yes. For example, the labor movement has created many private sector occupations: labor relations directors, mediators, specialty lawyers, consultants and other ancillary and counter roles. Another example is the history of the nuclear power movement. In this case the nuclear engineers and managers created a social movement (for nuclear power as a source of energy), built-up social structure and occupational identity, and influenced the institutionalization of a group of occupationalizing 'nuclear power professionals,' all, initially, in the private sector.

However, the general moderating variables we have identified - a movement sense of mission, movement generated resources, movement revitalization phases, counter movements emerging in response to the movement as part of a larger organizational field, rapid change and new problems from movement influences, and, underlying all of these, the

general public - all seem, whether or not they create jobs in the private sector, to throw the issue into the larger public arena and to create jobs there. In the case of the 'nuclear power professionals,' their occupationalizing brought forth counter movement, counter-roles and increasingly public contexts for knowledge and problem agendas. In short, their PISMO processes became more 'voice-sensitive' (Hirschman, 1970) and could not be contained in the private energy industrial system. In short, while the scope of our theory is not limited to public sector jobs, social movements, by their nature, are likely to create jobs in this sector.

For a century or more many new occupations have emerged through a process in which voluntary groups have worked with universities to foster the formalization of new positions. This institutionalization process has worked through local universities helping to set up credentialling activity in the local state legislatures. The scope of our theory adds, to this general 'rationalizing process' described by others, the role of the social movement (in addition to the state, the university and sundry voluntary groups). Social movements, in addition to influencing public credentialling processes, may establish their own certification procedures as is the case in some movement-generated professional associations.

The strength of the social movement goals as a 'sense of mission' may create both a strong origins effect and an ongoing mission-orientation which adds a distinct social movement-dimension to emergence of an occupation. This may be especially true in cases where the originating movement undergoes revitalization phases, adding further impetus to the build up of both social structure and occupational identity. In weak movements, resources for occupationalizing projects may be scarce. However, with strong or revitalizing movements such resources may be more munificent. Whether a successful 'social problem process' can be mounted (defining the situation as needing these new occupations) may well depend on the degree of resources available. These situations are unique to social movement instituted types of work where the social movement creates

its own market. They create an occupation that is 'voice-sensitive' to the demands of this new market and the incumbents have a propensity toward loyalty - they are beholden to the movement.

Given scarce resources in society, however, any movement that is strong enough to mobilize significant numbers of new labor market positions will become, in various ways, implicated in the public arena. This is often the case with strong social movements where they bring forth complex new interorganizational fields including many ancillary and counter-roles, and even counter movements. Such large organizational fields often cannot stay contained in the realm of 'private' resources. Such organizational fields may become complex 'sectors' implicated in a substantial portion of societal resources and inevitably brought into the public arena.

This is a second unique contribution within the scope of our theory: PISMO processes may be part of the emergence of large, complex, social movement- instituted organizational fields. One dimension of these organizational fields, and the new emerging occupations within them, is that there is a potential for rapid change and new sets of problems deriving from internal movement origins effects and such external influences as a continuing social movement. It may not be possible to accurately grasp a social movement institutionalizing occupation without examining the incumbents' network of contacts in such emerging organizational fields. Such organizational fields, as mentioned, will often become public sphere phenomena.

Finally, our theory emphasizes that where an occupation has a 'body of knowledge' and it is a social movement which is decisive in the transformation of a type a work into an emerging occupation, it is the social movement which will influence how knowledge grows (and not primarily processes of immanent development). Since much knowledge is generated or deconstructed and reconstructed in the public sector at universities, colleges and high schools, many strong social movements thus

enter the public arena in terms of influences on the direction of knowledge.

To summarize, the theory is intended to apply to social movement influenced occupations as a distinct type of occupationalizing. While 'occupationalizing' is broader in scope (see Abbott, 1989), the PISMO process theory is limited in scope, specific to the social movement cases of occupational emergence. Social movement influenced occupationalizing would seem almost always to emerge with, or to develop, a particular type of political vulnerability as an inherently public or political market - a type of market not characteristic of private sector jobs-that-become-occupations. PISMO process theory, while not limited to public sector jobs, theory tends to be a theory of public sector occupationalizing.

Another issue has to do with the extent to which the institutionalization of a social movement tends to produce its dissipation. Labor market positions institutionalized through a social movement may create incumbents who initially feel beholden to the movement. However, this raises the question: under what circumstances does the job become depoliticized? Does occupationalizing necessarily itself depoliticize, that is, create some buffer between the former or continuing social movement and the new incumbents? Is there a point where the incumbents say 'we're experts, let us do our job'? One hypothesis is that this depoliticization depends on the extent to which the problem the social movement was aimed at has been solved by the new labor market positions in themselves.

Unionism as a social movement is only one manifestation of the larger, historical labor movement. However, to the extent that the U.S. labor movement in the 20th century was trying to solve industrial relations problems through institutionalizing mechanisms of collective bargaining - legalizing collective bargaining - occupations instituted in collective bargaining mechanisms solved the problems. New occupations institutionalized mechanisms to deal with the problems. Specifically, the

emergence of occupations in the collective bargaining process (roles such as steward, labor relations director, mediator, arbitrator, consultant, specialty lawyer, and so forth) accomplished the solution. To the extent that the laws and newly enacted (or altered) occupational roles become the problem solving mechanism the success of occupationalizing depoliticized the labor movement.

On the other hand, clean water managers and other environmental management roles are only one approach to achievement of environmental movement goals. The emergence of such new occupations has not solved the problems of environmental crises. The institutionalization of environmental management roles was not in itself the goal of the environmental movement. Depoliticization does not occur as readily in the case where the problem is not solved by the labor market positions and by the occupationalizing itself. This fact highlights the continuing importance of analyzing environmental management roles and creating models of still emerging occupational trajectories produced by continuing social movement influences.

As part of its contribution, the dissertation presents an expected causal model of the relationships expected in the case of the emergence of clean water managers, forwards a three-step process in the emergence of this occupation, and presents eleven germane research questions. In the presentation of findings the expected causal model is modified in several ways in a series of revised causal model figures. Data and results from the case study are presented for each of the eleven research questions and a summary of findings and model of the interplay between occupational identity and social structure are presented. As a hypothesis-generating case study the dissertation proceeds to raise theoretically-based questions regarding the emergence of a particular type of occupation. The dissertation makes a contribution in presenting clarifying causal models, raising general researchable questions, assembling results and data, and

discussing them. Hypotheses generated by the study and general questions it raises are included in the next section.

General Theoretical Gaps Yet to be Filled

Since there have been few studies of the emergence of an occupation, the field of the sociology of occupations would benefit from a major research effort locating, reviewing and synthesizing this literature on an empirical and middle range processes level. Current theoretical studies (Abbott, 1988; Friedson, 1989), contribute to this area, but primarily review existing occupations or professions. A study with exhaustive reviews of the emergence of occupations literature, able to apply such a review to several case studies to demonstrate the theoretically important questions of the emergence of occupations, is needed.

Additional empirical research is needed on the emergence of environmental management occupations. Any additional research would benefit from a comprehensive literature review of a type that was beyond the scope of this study. Such a literature review would need to range widely through the many disciplines that might contain published accounts focused on the conditions relevant to environmental work or its emergence. Also, it has been argued in the sociology of occupations literature that, in order to truly contribute to the sociology of any type of work, it is necessary for the research to "know as much about that type of work as a competent practitioner." This author does not agree that the statement applies to exploratory hypothesis-generating research. However, to the extent that this is true for advanced study, longer term specialization in environmental management and water quality as a research subfield would be necessary to make a significant contribution. Because the topic of "occupationalization of clean water management" is an inherently political concept, understanding the nuances of "what is possible" would surely require an applied sociologist to have more years of experience and sophistication on the topic than is typically possible for a doctoral candidate. Even though a substantial case study has been assembled, and

cogent research questions raised, the documentary, action-research, interview, and survey data are modest efforts that fall short of the scope of original research required to make the most advanced type of contribution on this question.

In the effort to make a contribution to an understudied research area, the dissertation's review of theoretical perspectives is broad enough to include the relevant bodies of literature, but each body of literature is not reviewed in as thorough a manner as a more comprehensive study would necessitate. In fact, there is a need in the literature for a more thorough bringing together of theoretical perspectives on the topic of the emergence of an occupation. A monograph presenting such a theoretical review, integrated with a series of empirical case studies of the emergence of occupations, would make a better base for advanced conclusions, and could make a contribution to the field.

Perhaps the most distinctive contribution of the dissertation is to raise the question of the social movement influenced emergence of occupations and to propose studying the "occupational" conditions of the "program professional" component in such recently emerging occupations. This is clearly a large topic. Drawing upon organizational, professionalization, and social movement studies the hypothesis-generating effort of the dissertation is barely able to put this question on the table: "What is happening to the aging, mid-life, 'program professionals' in their emerging social movement influenced occupations?" Timely, potentially important, this historically specific issue which raises complex occupational and generational consciousness questions warrants additional research effort.

Substantive Research Contributions and Gaps of the Study and Specific Theoretical Implications

We presented a three-step model: establishing the position, filling the position, and occupationalizing the position. Of our eleven research questions, the first three (1-3) brought data to bear on the establishing

of the position, the next three (4-6) brought data to bear on the filling of the positions, and the last five (7-11) brought data to bear on the occupationalizing of the position. What are the specific research contributions and gaps to be filled for each of these questions, and what are some of the important specific theoretical implications?

Step One: Establishing the Position

How the environmental movement influenced the emergence of the position, research question #1, is a large question. The general historical, cultural and network dimensions of how the new regulatory clean water management organizational field became institutionalized have been presented in our historical review. However, besides this general history, there are specific historical parts of this story that may be germane that are missing in their detail.

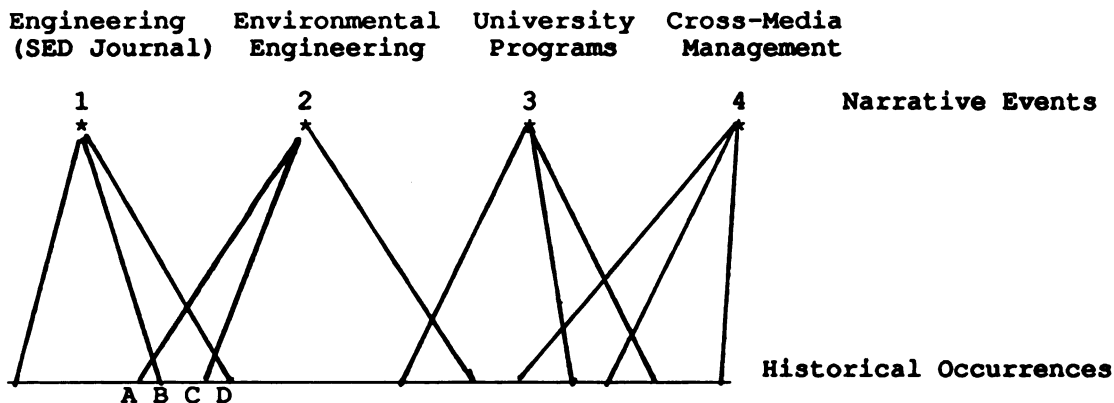
Many specific institutional processes shape behavior in water management. Such processes include: legal processes, economic processes, administrative processes, persuasive processes, administrative reorganization processes, planning processes, general social program, and other processes. Detailed histories of relevant occurrences in each of these specific processes was beyond the scope of the study.

Our focus, in reviewing U.S. water policy, on councils, committees and commissions highlighted the main story line but left out much of the specific occurrences in detail. Yet such detail might be useful in assembling a more comprehensive case study. The history we give is in the nature of a general narrative of events. To understand the sequence of occurrences in the emergence of an occupation it may not be as useful to document each occurrence as it would be to understand their relevance to "occupationalizing" of the actors involved - the active, dynamic social construction of the occurrence and its relevance to occupational events.

In much of the occupational literature the sequence of events (or steps) leading up to becoming an occupation is the focus. For example, Abbott (1992) emphasizes that where, in time, an occurrence happens may

not necessarily match up to the relevance of that occurrence to a professionalizing event. This is exemplified in the graphic he presents, which is reproduced as Figure 19, below.

Figure 19. A model of the relationship of narrative events of professionalizing "steps" and actual historical occurrences.



In the perspective exemplified by this figure, the narrative events (1-4) are "steps" in professionalization, such as the founding of a journal, an occupational name, a certification law, or a university program. For clean water managers event 1 might be the enlargement of professional activities around the initiation in 1955 of federal 30% incentive grants, a period when the SED Journal was expanded and bound monthly with new sections on sanitary engineering occupational news. Event 2 might be the transition between 1962 and 1972 in the field of sanitary engineering toward a more ecological perspective, culminating in the 1973 name change of the A.S.C.E. SED Journal to Environmental Engineering. Step 3 might be the initiation, growth and expansion of university programs in environmental studies and associated founding of environmental journals, societies and conferences. Step 4 might be the late 1980s and 1990s growing emphasis on cross-media management, in which air, water, toxic

wastes and ground water are more involved in actual occupational practices, signaling a tension toward more "coherent" management.

In Figure 19 the historical occurrences would be more specific and there may be some historical overlaps that would need to be sorted out. This is exemplified, in general, by noting that occurrences A and C, while they are occurring during event 1 may be, in their nature, more linked to narrative event 2. Our point is that, in order to understand where each specific historical occurrence fits in relation to the narrative events in the emergence of an occupation, considerable detail must be understood about each occurrence in the series of occurrences and about each professionalizing or "occupationalizing" narrative event. This is true because such occurrences and events constitute an overall "origins effect."

To example this point let us take the question of how the actual job descriptions of regulatory phase clean water manager positions were constructed. There are abstract conceptual components from hard and soft science professional, organizational, and social movement narrative events and sequences of occurrences. The abstract conceptual (professional) components of the job of "sanitary engineer" contained, for example, an incredibly broad scope of logical "sanitarian" activities, including air and water quality, toxics, waste management, etc. These abstract concepts of the work jurisdiction came from the internal (imminent) development worldview of the university-based sanitary engineering programs and from the ASCE Sanitary Engineering Division and its journal (SED Journal), professional meetings, lobbying and conference activity. The job description was set down in the "mission statement" of the ASCE SED Journal, for example, in the mid to late 1950s and had been essentially the same for 50 years.

The day-to-day job duties written up by the employing organizations, however, often did not have specific job description (organizational)

components to match all of the early, abstract conceptual (or professional) sanitarian activities.

The 1960s/1970s environmental movement, however, began to shift general U.S. water policy from its prior developmental, preservationist-conservation, and coordination phases into a new regulatory period. This external movement reorders attention within a series of legal, administrative, and reorganizational processes that rewrite old job descriptions and make new job duties in conformance with new (NEPA) permitting laws and (Clean Water Act of 1972) water quality standards. The EPA is formed, the 50 states civil services get new water quality jobs and alter existing ones.

It is true that there was a growth of knowledge about water quality during this period. Was the development of clean water management specialties close to the analogy of how in medicine ear, eyes, nose and throat specialties developed out of general practitioner occupations? In the medical case the specialties emerged as internal movements (see Bucher, 1961). But environmental management specialties have been pushed forward not so much by the growth of imminent knowledge (internal development), but from pressure to attend to the environmental movement agenda.

We have reviewed this external development influence as a movement effect or institutionalization effect. What is interesting about the role of commissions, committees and councils in their influence on and guidance of U.S. water policy, is that from a research perspective many of the historical occurrences and narrative events in the emergence of an occupation (e.g., clean water management) could be located in the committees, commissions or council reports. Combined with a review of professional journals and association newsletters, an accessible record of the influence of the environmental movement on the emergence (or alteration) of the position is available.

The strength of our general review of this environmental movement influence on the emergence of the position is that it clearly summarizes the general historical developments: the coalescence of conservationist, preservationist and wilderness movements into a new environmental consciousness epitomized by Rachel Carson's Silent Spring (1963) and concerns for the quality-of-life; the impact of the 1960s activism, growth of knowledge, increased outdoor recreation, the broadening of conservation organizational concerns; and the orchestrating of the emergence of a new environmental regulatory organizational field of new and altered clean water management work jurisdictions.

But in this general history what we are missing is the presentation of more comprehensive research on the set of specific historical occurrences that link with specific narrative occupational events. The commissions, committees and councils worked for twenty years (1945 to 1965) to establish comprehensive water quality planning without final success. Their resource conservation, resource development and agency coordination perspectives lacked the political action base required, thus perpetuating the broad, abstract scope of sanitary engineer's work jurisdiction without specific organizational job duties. On the other hand, once the issues of water became "environmental" a vastly enlarged political base emerged.

Our criticism of the trend of much of conventional "institutionalist" organizational literature is that it takes a governmental policy shift as a given (independent variable) and shows how the institutional environment created influences organizations. We argue that in order to understand the emergence of an occupation in the case of a social movement influencing a shift in government policy, it is important to focus on the government policy shift more as a dependent variable and to view the social movement as an independent (and interactive) variable. That is, there is a need to focus on the tense struggle to orchestrate the emergence of that shift in policy, (as an

"origins effect") and in subsequent years to keep influencing, or orchestrating, the nature of the emerging organizational field and its occupations (e.g., those institutionalized by the new laws). This said, while our research presents a general history of this period, it stops short of specifying in a precise way occurrences and events for the "origins effect" period of 1965-1977. This would be helpful research in a more comprehensive study and could provide a more direct application of current occupational theory attempting to specify processes in the emergence of an occupation.

With regard to research question #2, "How did the environmental movement influence characteristics of initial incumbents?", Mannheim reminds us that societal change may require theoretical reflection of a generation about itself. Our initial incumbents with 13 or more years on the job (in regulatory water quality work), were the first generation influenced by the shift to environmental thinking. We hypothesize that the environmental movement influenced initial role incumbents training, values and job history. Rather than the internal movement of the development of ideas away from "engineering" and toward "environmental" management, we have instead emphasized the primary influence of the environmental social movement as an external societal change and how it made for "the rhythmic movement in the history of ideas as affected by competition and the succession of generations." That is, the movement from "engineers" to "environmentalists" in state civil service water quality work is more accurately explained as a movement effect, a cohort effect, and an origins effect rather than as an internal intellectual development. The commitment to planning that is expressed by those with 13 years or more in water quality work, revealed in the intensive interviews and in the survey results is more a consequence of the movement and origins effects of the coalescing environmentalist period of the 1960s and 1970s than it is a continuing of the feature of an abstract work jurisdiction planning component of the early "sanitary engineer." It is the political base of

the environmental movement that makes the agenda for comprehensive planning "real" in the training, values and job history of the 1960s and 1970s generational first cohort.

Through law and political processes we describe how, in general, the environmental movement provided a sociocultural and historical context for a certain thought model for the initial incumbents as an emerging occupational group. That thought model was influenced by the general impact of systems thinking in the 1960s including active theoretical work in human ecology. In this sense there was internal intellectual development which our generational first cohort then picks up as a "competition and succession." But there is also the more important external movement of environmental consciousness and activism which simultaneously influences training, values and job history. Which is more important?

We report that in our informants' perspective the rise and importance of comprehensive environmental planning is the major social movement goal that has influenced their training, values and job history. However, while we examine job histories in the survey data and trace training and values in general in the documentary and interview research, we do not do the research and present data through the medium of any specific and elaborated measurement device. Wilensky (1964) presented a general chart of types of role orientation and roots in structure and biography in distinguishing professional, careerist, and missionary orientations and constructed an index of coded interview schedules distinguishing "professional-discipline" and "careerist" orientations, but did not measure social movement orientation. It would be helpful to be able to present an index of all three orientations - professional, organizational, and social movement.

However, one reason Wilensky may have remained vague in any measurement of social movement orientation is that this may seem inherently difficult to measure. How do you measure the extent that

incumbents of work roles take social movement goals as their own? One way is to take the major theme (or themes) of a social movement (through, for example, content analysis), and then code interview, survey, and occupational literature content of incumbent responses to discern modal overlaps. This is what we have done, with a small number of key informants, in our case study - with a conclusion that comprehensive environmental planning is a major movement goal that has become an individual goal for some of the initial incumbents. However, we have not constructed a formal coded index for these data sources (documentary, interview, survey), and our research was not preceded by the construction of such an index. A larger sample would be needed to make such an index reliable.

Additional work on such measurement devices might precede any further work on a case study of the influence of the environmental movement on initial incumbents. Moreover, our expected causal model includes continuing influences of the environmental movement on the initial incumbents and this becomes important during the phase immediately following the origins effect (1965-1977), the counter-movement of the Reagan-years (1980-1986) when the environmental movement went through a period of significant revitalization. Were there some significantly different movement goals and additional influences on initial incumbents training, values and job history during this counter-movement and revitalization phases? Are there further alterations in the goals in the continuing contemporary "global" phase (1988-current) of the continuing environmental movement? Has this most recent phase of the movement influenced the now middle-aged generational first cohort training, values and job history?

These questions are asked and answered in both general ways and with some specifics in the survey data. However, more specific, focused research breaking down in more detail the phases of the environmental movement would be helpful. In such a more focused study measurements could

be constructed of the continuing and changing movement goals on the training, values and job history of the aging initial incumbents, specifying the environmental influence.

In a more comprehensive case study the "critical events" (or battles) where these major environmental goals are tested by initial incumbents in the job would be the kind of detailed historical occurrences that may shed more light on the emergence of the occupation, and such critical events deserve longer treatment and more systematic study.

With regard to research question #3, "Did the emergence of the position and characteristics of the initial incumbents affect the environmental movement?", we revised the expected causal model to add interactive lines of influence between the attributes of the initial position and the environmental movement of that time, and between the attributes of the initial incumbents and the environmental movement at the time. In this modification of Step One, the origins effect period, we introduced a second model of interactive effects to augment the challenge and response model of social movement theory. We presented a discussion of an analogous case study, the rise of employee assistance program (EAP) "occupational program consultants" and noted how a more idiosyncratic, fortuitous, unintentional and interactive model could help explain historical occurrences and narrative events in the emergence of an occupation.

In that analogous case we noted that specific interactive effects evolved at the time of origins from the way the general social movement and contextual events led, during the originating phase, to a certain, very narrow, base adopted in the "occupational program consultant" role for employee problem identification - signs of work performance that could be written up. This resulted in the new EAP role playing a key link with both federal grants and area outpatient clinics around measurable employee work behavior. The alcoholism-as-a-disease and AA modality self-help movements had not started out interested in measurable employee work

behavior. This idiosyncratic way in which the components came together in both the initial positions and initial incumbents had an interactive effect on the occupational program consultant occupation that evolved, and to some extent this interactive effect influenced the social movement as well.

In a similar fashion, the social movement and general contextual events of the environmental era led to a certain, very narrow, base adopted in the clean water manager role, that of permitting to measurable water quality standards. The environmental movement had not started out with an interest in narrow water quality effluent standards, but rather with broad, abstract (imminent) conceptions of "sanitary," or wide-ranging, comprehensive ecological (external) "environmental" concerns. The importance of these general goals can be noted today: notice how hard it is to measure urban/rural runoff, air and general toxic water pollution in contrast to the originating, idiosyncratic emphases on point-source effluent water quality standards. The narrow permitting base for the work jurisdiction, thus, has had certain fortuitous consequences for the development of water quality management, and an interactive effect on the environmental movement. So, while our study was not designed to measure the interaction with the environmental movement during the origins effect period (other than through intensive interviews and general documentary sources), clearly many such fortuitous, unforeseen and idiosyncratic aspects of the way environmental management developed became of concern to initial incumbents and to members of the environmental movement during the period 1965-1979. A more comprehensive case study might focus on these evolving situations of fortuitous developments and measure their influence on social movement developments of the day. This might clarify additional, interactive dimensions of the processes through which, in the words of Maruyama, "deviation-amplifying" feedback loops occur.

A comprehensive case study could be focused on just the interactive effects during the origins effect period of a social movement influenced

occupational emergence. The way in which particular "kicks" or incidents activate positive or negative feedback loops could be examined. The way in which fortuitous events and connections may have occurred in favorable circumstances, "initiating open-ended processes of self-organization" could be documented, for example making use of resource mobilization theory (McCarthy & Zald, 1977; Jenkins & Perrow, 1968) and network theory (Freeman, 1974). The analytical difficulties associated with such contextual analysis are no less for the researcher than for the actors in the context - that is, acting, "reading the landscape," and making choices. Adding a fortuitous model to the challenge and response model, however, has the advantage of accenting possibilities in explanation (or choice) that may be missed utilizing only a conflict model.

Utilizing an interactive model requires, however, "systemic wisdom." As Maruyama emphasizes, in an interactive loop model it is necessary to identify principal subsystems or nests of loops that hang together. This might be exemplified by an occupational or professional subsystem that has nests of loops around the build up of support structures and occupational identity, and has a labor market "currency" of, say, a bio-chemical-environmental-impact-statement knowledge around a narrow-based permitting work jurisdiction. This nest of loops or subsystem might be labeled "dedicated environmental professionals." Another subsystem in our "systemic wisdom" viewpoint of reality would be the nests of loops that hang together around land developers, construction, politics and jobs. This nest of loops might be labeled "the growth coalition."

Maruyama notes it is necessary to modify the relations (of such subsystems) when necessary by reducing or increasing the strengths of existing linkages and adding or removing loops. For example, we could increase the strength of occupational or professional linkages of clean water managers (e.g., "the dedicated professionals") with the 1965 to 1979 build up of work jurisdictions, laws, and university support programs and professional associations pushed by the environmental movement. On the

other hand, a change in the developer/politics subsystem might include the 1980-1988 Reagan-years deregulation - strengthening developer/politics linkages ("the growth coalition"). During this period several incidents were affecting clean water manager occupational linkages, in some cases weakening environmental management (negative feedback loop), but on the other hand sparking a revitalization in the environmental movement (positive feedback loop). Many fortuitous incidents could be influencing strengthening and weakening processes within each subsystem. To understand a key linking role like wastewater treatment, water quality regulatory work such analyses are necessary.

Maruyama, for example, also emphasizes the need to give particular attention to the loops joining different systems. For example, the interaction between attributes of initial clean water manager positions and attributes of clean water manager incumbents with the environmental movement created or altered several loops joining the "dedicated environmental professionals" with "the growth coalition. In particular, the wastewater treatment field was developing during the origins effect period many loops "joining different subsystems" - the clean water manager role in wastewater treatment plants and drains links directly to the developer/politics subsystems. In a more comprehensive case study contextual analysis of the subsystems of such larger societal sectors with a research focus which examines the relationships of fortuitous events and such positive and negative feedback loop processes could help us understand the contingencies of how such a key link occupation emerges.

The institutionalist tradition may tend to emphasize the way such fortuitous contextual incidents cause unconscious or unplanned developments, but careful attention to context can also alert us to how conscious "occupationalizing processes" are applied in fortuitous circumstances. This is particularly important in the case of occupational emergence as the institutionalization of a social movement.

Our case study reports intensive interview and survey data supporting the hypothesis that initial incumbents interacted with the environmental movement during the origins effect period. We have also analyzed how certain fortuitous developments in the initial position affected subsequent developments in the environmental movement and reported documentary evidence of this. However, because an origins effect period is so important in change theory, organizational culture theory and social movement theory - and because we feel such origins effect contexts are so important for the theory and practice of occupational emergence - studying the interactive effects during this phase in an occupational story deserves a series of more focused research studies.

For the case of clean water managers further research could be designed which would involve focused interviews with senior generational first cohort (initial incumbent) water quality workers on their relationships to lobby organizations; interviews with university-based senior professors who would have witnessed some of the interactive effects; a broad search of secondary sources, including memoirs, books, and journals. There is a need for more research on this question. The implications of the program professional role, of the interactive effects, and of the meaning of "occupationalization" for the environmental movement are important. There are several 1960s and 1970s social movement influenced occupations, and studies of the contextual conditions of their emergence during origins effects periods would contribute to occupational sociology.

Step Two: Filling the Position

With regard to research question 4, "How did the initial definition of the position affect subsequent developments of it?", our brief review of the general structural, cultural and cohort levels of the formative origins effects period led us to examine how characteristics of the initial position affected subsequent developments of it. We found that the original characteristics of knowledge and complexity had remained and led

to increases in knowledge required and complexity in the job. More importantly, we found that the originating "soft science," multidisciplinary roles had led to an "equalization" in the selection process of filling the roles - an equalization between engineers on the one hand and planners and biologists on the other. The structural and cultural dimensions of the "origins effect" - a national program to bring in more planners and biologists, needed for a more comprehensive approach to project planning, and for EIS statements - had worked over time. The recruitment of "environmentalist" roles was due, importantly, to the institutionalization of the social movement goal during the origins effect. But there were also the attributes of growing complexity of the organizational network and the extensive knowledge base required which helped push for more planners and biologists.

The permit system has implicated the position in more ecological and legal knowledge, and in more paperwork and public contact. The need for more ecological knowledge stems directly from the establishment of positions monitoring water quality standards. The permitting systems, requirements for environmental impact statements, and justifications of decisions made implicates the position increasingly in legal knowledge, public contact and paperwork. We found a perception, on the other hand, of limited authority due to the narrow permit-based work jurisdiction and also due to the political conditions of water quality work. Survey responses included statements that clean water manager work was more "balanced" than the goals of the environmental movement, and also that the complexity of their organizational field contacts made them "more aware of the regulated community." However, the composite interviews of the 1987 organizational development project showed a consensus in the municipal facilities unit that increased participation in higher level decision-making meetings and fewer limits on decision-making authority were desired.

In the context of all these complexity, knowledge and authority and autonomy concerns, rapid change also impacts the role. If the clean water managers are going to "occupationalize" their job further they may need to place more emphasis on intra-positional mobility. The attributes of the initial position may be too bureaucratic and narrow to facilitate environmental management in the context of increasing knowledge-growth, network complexity and rapid change. The limited authority "knot" will not be unraveled without some improvement in the build up of social structure and group consciousness among the clean water managers. This will be accomplished, to some extent, through the devices of intra-positional mobility: encouragement of study-time, joining existing (or forming new) occupational associations, release time for guest speaking, brown bags and topical seminars, travel pay and other professional-like "occupationalizing" activities.

In addition to helping to overcome the idiosyncratic defects in the attributes of the initial positions to make for effective environmental management, such intra-positional activity structures also build up group consciousness and could aid in the political education of clean water managers. However, our research tends to show that much of the identification with intra-positional goals tend to be with the older initial incumbents (and less so with younger job cohorts). Therefore it appears that the incentive and leadership for this type of occupational movement (i.e., for the development of intra-positional mobility support structures) may have to come from the senior clean water managers.

With regard to research question #5, "How did the characteristics of the initial role incumbents affect subsequent development of the role?", our intensive interviews with key informants suggested the existence of a large number of initial incumbents who entered the initial positions 13 or more years ago (prior to 1981) and were still in these or similar water quality regulatory work positions. The 1992 questionnaire of mid-Michigan Surface Water Division water quality workers indicated that 31% of the

survey sample were "generational first cohort." Our research question #5 asks how the characteristics of the initial incumbents may have affected subsequent developments of the role. Our cohort effect hypothesis focuses on the fact that the initial incumbents lived their young adult and university years during the shift in U.S. water policy from development and coordination to regulation.

This shift, pushed by the atmosphere of the new environmental movement, created a context where, as the work roles shifted from "engineering solutions" to "environmental regulation," the new program initial incumbents were also entering these new or altered roles as an existing or potential political "generational unit" (Mannheim, 1936). During this "origins effect" period of the actual institutionalization of environmental management into new roles, the reformists and, (to a lesser degree), the radicals, began to constitute the bulk of the environmental movement. The placement of the generational first cohort in this context at the origin makes us ask: What is the character of the social movement goals that the initial incumbents took with them into the initial positions? And have these goals as initial incumbent characteristics affected the subsequent development of the role?

These types of questions are underdeveloped in the literature, as discussed. Following Wilensky (1964), we simply asked about "commitment to environmental goals." Our intensive interviews and survey results show that in some simple, direct sense, the initial incumbents have been "carrying movement goals as their own" - the Wilensky program professional hypothesis. The environmental movement is a mixture of complex ideologies. The institutional level of clean water managers, for example, appears to be "reformist" but our research indicated ideological elements of the generational first cohort include other, more anti-institutional, only partially institutionalized beliefs, values, and norms including: radical as well as reform, cultural movement, meliorist, and social liberation movement components.

This element of continuing, anti-institutional consciousness type of social movement identification, at the ideological level, not fully institutionalized in reformist work roles, may prove to be an important tension between individual and social structure.

Were there interactive effects between the initial incumbents as an emerging generational cohort and the emerging occupation? This is a difficult research question to answer and would require a larger sample of intensive interviews constructing in-depth biographies and it would also require a very thorough type of historical research. However, the importance of asking this question is not only to document a cohort effect as an origins effect in the early period of the new roles, but in the context of the political base provided by the nature of the continuing environmental movement, to examine the continuing potential of the initial incumbents as a generational cohort. Their anti-institutional orientations may be setting up an interactive effect with the institutionalized component of the work culture, and influence the emerging nature of the occupation. These tensions seem to be influencing the frustrations with limited authority and limited intra-positional mobility and to operate as an ideological base of power (in an occupational sense) around growth of knowledge, complexity, and rapid change. It may be the generational first cohort which takes the occupational movement in this work role further steps.

With regard to research question #6, "Were there continuing influences of the environmental movement on subsequent development of the position?", we determined in asking what influences the environmental movement had on the continuing development of the position, that there were three phases: the consolidation phase, the revitalization phase, and a more recent global concern phase (1988-current). The two different earlier phases of the continuing environmental movement may have had distinct influences on the direction of changes in the position as the position becomes a partially emerged occupation. The consolidating phase

occurred from 1970 to 1980, and the revitalization phase from 1980 to 1986. Interview data from the initial incumbents indicate that, in addition to "carrying the movement goals as their own," (cohort effect), the experiences of the generational first cohort were somewhat influenced by the continuing environmental movement (movement effect).

During the consolidation phase anecdotes from the intensive interviews suggest awareness of environmental lobby, litigation, the movement push for university programs, alternative energy, soft path development and other 1970s trends. It is hypothesized that a program professional may experience increasing autonomy when the social movement, whose goals he or she carries, has continuing strength, for example in a consolidating phase.

Part of the strength of the consolidating phase would reside in the ability to build up the movement's imprint in support structures through more formalized training and socialization patterns. Careers also could become more formalized and orderly. We have seen that during the consolidation phase the shift in U.S. water policy to the regulatory period included passage of level-funding for the wastewater treatment plant and drains comprehensive planning grants program. This movement-bolstered direction of change in the occupation also helped develop a distinct "ethos" among late 1970s civil service environmental managers, representing the emergence of an external social-movement-type of occupational identity not characteristic of emerging occupations that are influenced only by internal movements or by no movement influence at all.

Part Three: Occupationalizing the Position

We have defined occupationalizing as any set of processes - e.g., pressures for autonomy, formal training and socialization, and standardized or orderly career paths - through which the development or build up of support structures and shared occupational identity emerge. This process is a broader model than traditional occupational sociology

models of professionalization (see Abbott, 1988), and may take specific forms for each emerging occupation.

With regard to research question #7 we asked what structural supports for recent clean water manager positions have developed. The earlier preservationist movement did not require many occupations, while on the other hand the later conservationist-efficiency movement relied on production scientists, e.g., to increase sustainable yields. However, the recent regulatory and ecological environmental movement expands the role of impact scientists as well as production scientists and creates jobs for many new technologists.

One consequence of this movement-influenced shift in the occupational structure over the last 25 years was the push for hundreds of new university programs, dozens of new professional associations, many new or altered journals and a myriad of conferences. Strained by the need for impact science types of work required to do Environmental Impact Statements (EIS) and to carry out the new types of regulation, the environmental movement helped push for the institutionalization of both new laws creating and expanding the role of such impact science positions, and the new support structures such as university programs described.

However, because the many new positions in clean water work are program specific - grants management, EIS statements, permit writer, lab testing, fieldwork, compliance and enforcement - the graduates from the new university programs get placed in specific program slots with limited career steps. The environmental movement created, through law, the new programs. However, because of limited career steps in the program slots, the general result has been vague career lines in the environmental regulation labor market.

Has social structure been built-up around these new labor market positions? Again, the environmental movement pushed for new, generalist university programs which have added social support and more formalized training to clean water work. However, the vagueness of many of the

university degree labels (e.g., "resource developer," "environmental studies") tends to reflect the indistinct career lines extant in the program specific labor market positions.

One set of occupationalizing pressures our results found seems to come from the dimension of increasing knowledge and complexity characteristic of clean water management work. This increasing knowledge and complexity has been due to two types of developments: 1) changes internal (imminent) to the field of sanitary or environmental engineering, and 2) changes external (contextual) to the field of sanitary or environmental engineering.

Internal knowledge growth and complexity has come, in turn, from two sources: first, academic-based and research-oriented science in the university traversing sixty years from the first sanitary engineering programs in the early 1900s to the situation described in the graduate schools by 1961, and, secondly, internal knowledge and complexity in clean water research generally that has been stimulated by the new (NEPA) water quality standards adopted in the 1960s era environmental management which stimulated new levels of internal research and academic developments. That is, the mold within which internal knowledge and complexity developments proceeded after 1965 was set by the laws, standards, EIS requirements for measurement, new problems and infusion of new internal agendas pushed by the environmental movement.

Our review of the seventeen years of the bi-monthly SED Journal between 1955 and 1973, led us to make two conclusions: 1) in the pure internal developments of sanitary engineering by 1961, even though biology, chemistry and planning were being included in some curricula, the overall emphasis remained on engineering for the small number of sanitary engineers in labor market positions at that time; but that, 2) as the impact of the environmental movement on sanitary engineering proceeded through the 1960s and into the early 1970s, the field made a series of

dramatic transitions toward more comprehensive ecological planning and environmental regulation.

Social structure had built-up prior to 1961 for sanitary engineering in the form of the ASCE division SED Journal, occasional conferences, 30% federal incentive funding (by 1955), a shift from undergraduate to graduate programs at 60 universities with a total annual graduate enrollment of 413 persons. However, after 1961, the influence of the environmental movement greatly increased these types of social structural supports: the number of conferences increased (more and more with "ecological" and regulatory themes), the number of laws increased, vastly expanding the labor market positions, the federal funding for wastewater treatment plants went from 30% to 75%, federal funding for research and graduate students increased, and the late 1960s and especially during the 1970s the number of university programs increased. By 1990, 30,000 environmental engineers were being graduated yearly. What are the research hypotheses and theoretical implications of this story?

Our results show an obvious connection in the field of sanitary engineering between the external developments (the orchestrating of an environmentalist regulatory program) and the internal developments (academic base and labor market positions within the new regulatory programs). For example, the internal knowledge and complexity increased after the "origins effect" period (1965-1977), suggesting this type of connection. The growth of knowledge and complexity reported by our survey respondents over their tenure as senior workers from the mid-1970s to the present reflects a continuation of this relationship between external and internal developments. Added to the increased complexity and growth of knowledge are the distinct differences in sense of mission: the 1950's sanitary engineer was lacking "in feelings of enthusiasm" about his profession whereas our survey data and interviews support a conclusion that the contemporary mission orientation of clean water management workers is very strong. The argument of our model, summarized in Figure

16, is that knowledge growth, complexity, sense of mission, rapid change and new sets of problems are currently acting as potential moderating (or intervening) variables facilitating additional build up of social structure. So our theoretical-based content-analysis of the bi-monthly history of the SED Journal, from 1955 to 1972, leads us to conclude that the initiating influence for much of the build up of social structure was environmental movement influence: shifts in federal water policy, the specific events of the environmental movement itself, new laws and the widespread origins effect of the period, including development of a mission orientation. However, once the laws and programs were established, certain origins effects then channeled subsequent direction of growth and knowledge and complexity as an internal development.

Our question is, having reached strong external movement-influenced origins effects and strong subsequent origins-effect influenced internal characteristics of complexity and knowledge growth, where does further initiative for additional build up of social structure come from and how specifically does this occur?

One of the differences between the pre-1965 "sanitary engineer" and the post-1965 "environmental engineer" period is that during the last 30 years several waves or phases of environmental movement consciousness has influenced the incumbents of clean water positions. Contemporary occupational identity includes a stronger mission orientation. Evidence in the intensive interviews showed the influence of the environmental movement on initial incumbents. How has this increased mission orientation affected professional or organizational concerns for more social structure?

On-the-job training has increased, e.g., showing additional build up of structural supports. However, evidence from the 1987 organizational development project showed that the strong mission orientation of incumbents is joined by an "occupationalizing" concern for a need for additional training. How strongly mid-Michigan clean water managers of the

1990s feel that more specialized academic training, continuing education, or attendance at professional meetings are needed indicates current assessments in the Surface Water Division of the need for additional build up of structural supports and may also measure weakness in existing structural supports. Strong mission orientation, complexity, knowledge growth, rapid change and new problems act as facilitating variables allowing what occupational identity that has developed to translate "occupationalizing" concerns into additional social structure. Survey results on additional specialized training taken in recent years indicate a wide range of training that may not be able to be fully provided by the MDNR itself.

Interview and survey comments emphasized "not enough time" to get additional training. Since 85% of the survey respondents answered that all or a great deal of the skills and knowledge required for water quality related environmental work was learned on-the-job, additional focused training in on-the-job workshops or short off-the-job seminars, seem like an important type of additional social structure, especially given growth of knowledge, complexity, rapid change, and new problems. Ninety-six percent of respondents say that continuing education on or off the job is needed. Some clean water manager work needs more "occupationalizing" social structure (on-the-job) while other clean water manager work needs more "professional" (away-from-job) social structure, (e.g., conferences, association meetings, etc.). For example, more than half of the sample feel attendance at meetings of professional associations is needed, and they also are the half of the survey sample who subscribe to professional journals. A large amount of work-related contacts outside the section may reinforce emerging occupational identity.

However, while occupationalizing processes and professional commitment seem generally strong in the survey sample, nevertheless 74% did not join any work-related organization other than the Michigan Professional Employees Society (MPES). Our model of reciprocally

reinforcing occupationalizing processes (Figure 18) suggests that as social structure increases additional occupational identity builds up, facilitated, again, by the moderating variables of strong sense of mission, knowledge growth, complexity, rapid change and new sets of problems. This model suggests specific hypotheses that should be tested in further research. Our research does show there has been build up of social structure over the last forty years and in recent decades in the MDNR. How do the DNR water quality workers identify themselves?

A common occupational identity is a significant measure of when a new occupation has emerged. Our research question #8 asked: "Has a consciousness of occupational identity emerged?" Fifty-seven percent of the sample see their present work as being part of a broader occupation and when asked "How would you describe your occupation?", 24 responded with similar occupational labels. These common occupational identity labels characteristic of the self-identity of 50% of the sample utilized the occupational title of "environmental" (as in "environmental manager"). This suggests a common occupational identity has emerged around the broad, abstract label of "environmental manager" or "environmental professional." It might be hypothesized that the continuing influence of the environmental movement and the identification of wastewater managers and water quality managers with this movement has had the effect of inhibiting development of a more specific identity associated with the job itself. Seventy-seven percent of the sample, however, agree that they see their job as a profession like medicine or law, and, as mentioned, 57% subscribe to one or more scientific-professional journal and 60% have joined issue-oriented environmental organizations or associations.

In summary, we can say that considerable occupational identity exists around a common general label, a self-image of being a professional has developed, and there is association with issue-oriented and scientific organizations and subscribing to their journals. However, the degree of

development of occupational identity does not extend to joining specifically work-related occupational organizations.

The Clean Water Management Program Professional: A Partial Occupational Emergence

As end products of broad social movements of social reform the program professionals combine professional standards of work with programmatic sense. In clean water management the programmatic sense has shifted from water specialists toward a more integrated practice in planning, EIS, permitting and funding. The newer view is to move away from narrow, single media, orientations (air, water, toxics, surfacewater, groundwater, point-source, non-point-source) toward cross-cutting environmental management practices.

For example, in the current (1993) municipal facilities (revolving fund) plan review and EIS practices the wastewater treatment projects include work routines that systematically apply laws from air pollution, toxic wastes legislation, groundwater law, and other legal and regulatory sections of the DNR. The continuous new problems that seem to emerge for long-time wastewater treatment water quality workers has meant that their emerging clean water manager occupation has halted in its narrow single-media evolution at an only partial occupational level emergence while their programmatic duties have expanded out in cross-cutting work-related contacts with other DNR sections.

One example, for wastewater treatment, makes this "cross-cutting" dimension of water quality work clear. Cleaning the water at the wastewater treatment plant produces sludge, the solid waste that is at the bottom of the ponds and that is extracted in the filtering processes. Because solid waste is produced that may be toxic, municipal facility program professionals need to be in contact with the DNR solid waste and toxic waste sections. Because much of the sludge is incinerated the municipal facilities program professional must review the laws on air pollution and be in contact with those DNR sections. The air pollution

with trace toxins settles on the land and is subject to non-point urban runoff leading to water pollution, and so forth.

What social structural supports do the municipal facilities water quality workers have in an occupational sense to help them on their job? Evidence of change in supports for wastewater treatment water quality work in the Municipal Facilities Section can be found in the procedures manual. Due to continuous new problems, due to increasing cross-cutting contacts and responsibilities to include other media law (air, toxins, etc.) which involves increasing work-related contacts outside of the section, the procedures manual is almost constantly under revision. What started out as a water program with the 1969 NEPA and 1972 Clean Water Act, has become a broader, cross-cutting, environmental management program. What, as a consequence of these developments, has happened to the story of the clean water manager occupational emergence?

The answer, in short, is that there has been only a partial occupational emergence. Civil service job descriptions for "water specialists" or "water analysts" were more characteristic of the consolidation phase of the environmental movement when the municipal facilities grants program was new (1977-to-mid-1980s). As the new problems have emerged and as the cross-cutting, cross-media work has increased, the program job descriptions have changed to "environmental analyst." The narrow, media-specific sections (air, water, toxics, solid waste, etc.) continue, but have within them increasing "environmental analyst" roles replacing some of the narrow media specialist roles. Another example of this direction is the role of being a "storm water expert" which spans many fields. What are the implications of this type of change for the emergence of self-governing occupational social structure and consciousness in clean water or environmental management work?

First of all, the case of the program professionals may be different from many other types of emerging occupations that, once institutionalized, may stay the same for a long period of time. As we have

discussed, the social movement influenced program professional positions vary with the fortunes of the social movement, the ups and downs of the program - it is in the nature of the program professional type of occupation to often be only "partially emerged." The fact that what were once developing as water occupations have now become, to some extent, more cross-cutting environmental management occupations may explain why so many mid-Michigan Surface Water Division water quality workers describe their job as part of a larger occupation such as "environmental management" and do not describe their job in terms of being a "water occupation" - even though there were several comments that individuals may "love aquatic systems."

However, our question is different. On the one hand, in 1961, there were only a very few sanitary engineers in the U.S. and the graduate schools could hardly get enough interest and enrollments to keep their programs going. The sanitary engineering faculty had, at that time, a broad mission statement for the sanitary engineer and a wide-ranging, abstract definition of work jurisdiction (that included air, water, toxics, etc.). On the other hand, in addition to low enrollments, they also talked often of the problem of a lack of professional status or lack of strong occupational identity for the role of sanitary engineer. Now, thirty-five years later, thousands and tens of thousands of "environmental engineers" stream out of the graduate schools and take myriad positions in environmental programs. Yet, while a tremendous build up in the sense of mission has occurred, while new university programs and other social structures have built-up, and while many moderating or facilitating variables (such as complexity, knowledge, rapid change, new problems) have emerged - the contemporary "environmental manager" in clean water management water quality work does not typically join any work-related occupational organization. The strong mission-orientation motivates many of our sample to subscribe to issue-oriented and scientific journals (57% do so), but fewer than 25% join any work-related occupational organization

(for the list of such organizations joined see Table 7, p. 283). What explains this phenomenon?

Why Do So Few Clean Water Managers Join Work-Related Occupational Organizations?

One answer to this question is that in order for a clean water manager to do his or her cross-cutting, cross-media regulatory job it may become necessary for some positions to keep abreast of more than one medium and to consult more than one source or type of pollution. For example, of those mid-Michigan Surface Water Division water quality workers who do join work-related occupational organizations, they tend to join two organizations (not one). The organizations joined tend to include the engineering, chemical, fisheries, toxicology and environmental health occupational domains.

However, with the exception of the International Association for Great Lakes Research and the American Fisheries Society, not all of these organizations put any primary focus on water. And, while each of these organizations may attend as a side issue to occupational news and concerns (we have reviewed the ASCE SED Journal occupational newsletter), no one of these organizations is specifically focused on clean water management or environmental management as an occupation. What occupational news and social structural support this minority (25% of our sample) get, who join such work-related organizations, is minimal. Moreover, 75% of Michigan clean water managers don't join such organizations.

Another explanation of this circumstance would interpret not joining water organizations as a consequence of how clean water management has evolved in programs where much of the knowledge needed is learned on-the-job. Several sections of the Surface Water Division (Permits, Enforcement, Municipal Facilities Grants/Loans) may not have any specific occupational organizations that have been created to join. The procedures manual, in these cases, is one, proximate occupational support structure for a complex, changing program.

There may be still other reasons helping to explain a lack of joining (or forming) work-related occupational organizations. For example, there seems to be a consistency between the earlier sanitary engineer and the contemporary environmental engineer in terms of low joining of occupational organizations. Is this due to a longer standing "origins effect" of the work culture of civil engineering itself? There have been reports in the occupational literature of traditional low professional identity among engineers (Wilensky, 1964; Meiksins, 1993). Is this low professional identification persisting within the public engineering work culture, even amidst tremendously increased environmental movement influenced mission orientations?

Is there a self-selection of personality types into environmental engineering that may be outdoor, rural, issue-oriented and technical, but not necessarily very much oriented to the social skills connected to building, or joining existing, occupational support structures?

Does the civil service context of neutrality, rules and regulations, and so forth inhibit occupational association?

Do other emerging occupations get to this juncture, where there is a building up of occupational identity and a build up of moderating or facilitating variables, but where there may be a lack of initiating structure to move across some threshold toward more specific occupational social structure?

Are there existing networks (e.g., cross-cutting contacts?) that might facilitate the success of such initiative if it were taken? Where would the initiative come from: senior workers, younger cohorts, the DNR human resource department, the environmental movement, the existing professional and scientific organizations? Or some combination of several of these?

The political conditions at the federal level of the early 1980s counter movement may have created an atmosphere affecting work-related occupational organizations. Again, political conditions at the state level

in Michigan in the early 1990s may have affected the rate of joining or forming such work-related organizations. The political shift of the 1992 national elections and the reforms of 1993 and beyond may set yet another stage, perhaps for a more facilitating atmosphere for build up of social structure in a political sense. But, on the other hand, cutbacks and fiscal crisis may prevent much resources from flowing to the DNR for water quality occupational activities or build up of intrapositional mobility.

The conditions of the continuing social movement may affect build up of occupational organizations in a negative sense in that the environmental movement does not tend to focus directly on work-related occupational social structure. Instead, the continuing environmental movement tends to reinforce the "mission orientation" attribute of incumbents. That is, the environmental movement can tend to "whip up" (environmentalist) content issues, but does not tend to encourage process (job-focused or occupationalizing) issues. Can the environmental movement focus more on how environmental managers do their job in an applied occupational sociology and human resource development sense, and help build social structure?

These are some of the strengths, weaknesses, opportunities and threats that an occupational model of consciousness can locate in clean water manager work and that clean water managers can draw upon to build up a more self-governing occupation. Yet some initiating structure may be needed. What types of solidarity, for example, can an emerging occupation develop when 75% of the incumbents do not join an occupational organization?

Type of Solidarity: Union, Professional or Occupational?

Why so little focus specifically on occupations in clean water management? Most people come from diverse areas of study. Yet we argue that the build up of moderating variables can facilitate the build up of social structure given the generally high degree of consensus on a broad "environmental management" occupational identity. But one of the problems

may involve social skills or lack of cultural-action skills that may be a part of an engineering or technologist work culture. This has been discussed and, again, we argued that some additional social structures to facilitate intra-positional mobility could help develop further the social and cultural skills needed to translate the occupational identity into more fully self-governing occupational structures, e.g. an occupational association more specific to clean water management work.

A lot of the evidence for emergence of an occupational identity is evidence for an "environmental management" identity and is not so much specifically related to water. But a general occupational identity, broadly viewed, such as "environmental manager" does not naturally lead to any special focus on the occupational attributes and direction of change specific to water quality regulatory work. There is evidence that moderating variables (complexity, knowledge, rapid change, new problems, cross-media management, strong sense of mission, etc.) is leading, in water quality work, to a stronger occupational identity as a broadly conceived environmental manager or environmental professional. It might be hypothesized that what is emerging is a general occupational identity to be followed later by emergence of specific subspecialties as occupations in themselves.

Abbott (1988) has suggested that occupational sociology needs more models of occupational consciousness than an orientation toward either unionism and professionalism. Perhaps his point can be made by an anecdote from our case study. When I was describing some of the findings of this study to one of the key informants he wondered whether the MPES (Michigan Professional Employees Society) would be interested: "As a union they are trying to increase the professionalism of employees." The problem with this view is precisely the dilemma Abbott is focusing on: How can social structure develop that fosters occupational self-governance? The unionism and professionalism models may not be well adapted to the potential for the new, mixed forms of program professionals to build up the needed

social structure and occupational identity for occupational self-governance. Do clean water managers want to be professionals or union members? Or do they want to clean up the water and keep it that way? Are they potentially more committed to solidarity models of broad bargaining units, to general expert status, or to solidarity models of occupational concerns of a mission-oriented program?

Applied Implications

While many sections and units have high quality managers, the DNR and civil service conditions of employment generally put impediments in the way of occupationalizing. Rather than encouraging professionalization, there can often be a narrow emphasis on productivity, neutrality and being non-wasteful public servants. This is an oversimplification. However, clean water managers may need work-based support structures such as "sabbaticals," support to go to meetings, rewards for research and publishing, short half-day leaves of absence to be guest speakers at high schools, colleges, universities, more on-the-job training, brown bag seminars, and so forth to expand the social network process of water-specific, environmental manager, occupational identification. This brief list of applied suggestions can, it is here argued, act as the additional social structure that, in a reciprocally reinforcing fashion, can lead to significant increases in the "occupationalness" of clean water manager work which, we hypothesize, would increase their effectiveness in dealing with water management problems.

Consciousness, Cohorts, Complexity and the Program Professional: Where Do Clean Water Managers Want to Go?

With regard to research question #9, "If there is a 'second cohort' how does it relate to the occupationalizing process?", a second cohort does seem to be developing among mid-Michigan Surface Water Division water quality workers. Educated in more focused programs, they all indicate their present job relates to their degree. Imbued with a more well-developed, more coherent occupational ideology, they nearly all agree they

are "environmental professionals." Some have been socialized as "program professionals" in the historical context of the 1980s revitalization and global concern phases of the environmental movement. Two-thirds of them indicate an ecological interest or "environmental" reason for going into their work. Subject to new influences, such as changes in the evolution of federal programs, maturing university programs, revitalization phases of the movement, and being the generation coming after the baby boom, second cohort characteristics appear to include more elaborated occupational activity. However, while the second cohort has a high membership in issue-oriented organizations, it has a low membership in work-related or occupational organizations. Where does the second cohort want to go with clean water management work?

With regard to research question #10, "How has the environmental movement affected the increasing complexity of the position?", we have amassed much case study evidence that the environmental movement has had the effect of increasing the complexity as an attribute in the alteration of the sanitary engineer into the environmental engineer. What has been the effect of this increasing complexity on our emerging occupation?

Wilensky has noted that an occupation, in order to become a profession, had to have a body of knowledge that was neither too vague nor too precise, not too broad or too narrow. He said:

Many new or aspiring professions face this barrier because they are grounded mainly in human-relations skills or some program of reform. The search of social work for a technical base illustrates the dilemma of most "human-relations professions" - knowledge which is at once too broad and too vague. Paradoxically, knowledge at the other extreme - narrowly restricted, very precise - is also a poor foundation for professional jurisdiction. When we are able to break a skill down into component elements, prescribe sequences of tasks in a performance, leaving little to the judgment and understanding of the worker, we have a job that can be taught to most people, often in a short time. . . (Wilensky, 1964, 148-149).

It would seem that part of the problems of professionalization of the sanitary engineer was that, on the one hand, the actual practice of pre-environmental movement wastewater treatment was fairly narrow and precise (as in "the tilt of the pipe" to ensure flow to the river). On the

other hand, the broad, academic-based, inclusive vision of a work domain (extant in the 1950s) was lacking a political reform and cultural movement base to translate the abstract work jurisdiction into labor market positions or regulatory organizational program reality. Now that the organization and labor market positions are there, the complexity introduced by the environmental movement may be affecting the occupationalizing of the work jurisdiction in two distinct, but related, ways.

On the one hand the new slots in the new bureaucratic environmental management programs tended to initially emerge as narrow, single media, bureaucratic program slots: permit writer, grants manager, EIS writer, separate air, water, toxics and groundwater sections and roles, enforcement and compliance, and so forth. This introduced new complications of EIS statements, water quality standards, permits and the associated changes in build up of new university programs, journals and led to a growth of knowledge.

Over time, however, as continuously emerging new problems, new knowledge, and rapid change made their impact on the practices within these program roles, the work jurisdictions of some incumbents have gotten more complex in a second way: increasing cross-cutting, cross-media environmental management duties. What do these two trends mean for occupationalizing?

On the one hand the initial multiplication of narrow program slots brought with it the problem Wilensky noted - of being still too narrow and technical. The occupational incumbents had a hard time "seeing themselves as being in a career." On the other hand, the more recent cross-cutting, cross-media duties, while they are exciting in terms of better comprehensive planning, may tend toward the opposite problem of being too vague in the current terms the work jurisdictions take. The program of reform is taking Surface Water Division water quality workers into increased cross-cutting contacts with persons responsible for

environmental laws and program rules in other sections. However, these contacts tend to be limited to specific rule-bound, narrow questions involved in writing EIS statements or issuing permits. What would be needed for a type of occupationalization similar to classical professions (like medicine or law) is the type of knowledge base or doctrine that can establish a technical service ideal that draws on a higher degree of tacit knowledge. It is the element of tacit knowledge in the sciences and professions (Wilensky, 1964) that helps explain, in part, their achievement of exclusive work jurisdiction - and parenthetically may contribute to the social structures of self-governance.

Surely no one else is writing EIS or writing permits for the surface water quality problems of Michigan than our incumbents. There is an exclusive work jurisdiction given in law - in the program labor market positions. However, is there potential for the exercise of some tacit knowledge? It may be that in these partially emerged occupations significant capabilities for the growth and application of tacit knowledge is currently left partially undeveloped. The cross-cutting, cross-media "environmental management" is, than, a facilitating dimension for the growth and application of such potential tacit knowledge.

In summary, while the environmental movement has added complexity through a proliferation of program roles and, in more recent years, with increases in cross-cutting, cross-media contacts, existing work jurisdiction strategies could benefit from additional innovation of social structure to realize the potentials to, in particular, build up tacit knowledge, and in general to occupationalize the role. How could complexity begin to work for MDNR water quality workers, to help establish a clearer technical service ideal?

A recent journalistic critic of the Michigan environmental programs suggests a continuing, grass roots, environmental influence may be occurring, affecting the design of the delivery of service by the MDNR environmental managers. He writes:

Beginning in 1993, Michigan's people and their leaders will have to rethink how we protect our environment, facing the challenges of runaway ecosystem change, scarce public funds for new programs and the human tendency to concentrate on today's rather than tomorrow's issues. Here are some opportunities:

- Make performance, not paper, the measure of protection. Starved of revenues, federal and state environmental programs will never do the job using conventional strategies that rely on legions of rule and permit writers in central offices.

The Clean Water Fund recently found that Michigan has more than 3,000 illegal, unpermitted groundwater pollution sources, but only two full-time field staff in the state Department of Natural Resources to monitor compliance with groundwater laws. The state, meanwhile, employs more than a dozen people to write permits that allow businesses to dispose of their wastes.

Rather than hiring more staff to write more permits, the state must promulgate general requirements for pollution sources and then look for those who fail to comply. That doesn't mean varying pollution standards depending on who is doing the checking; staff must be trained to assure tough statewide rules are observed.

- Harness citizen energy. Most of the advances in Michigan's environmental protection over the last five years have resulted from public pressure . . . The public is way ahead of its officials on the need for firm environmental protection. (Dave Dempsey, program director Clean Water Action, Detroit Free Press, Jan. 28, 1993).

Eighty-five percent of our sample report much of the skills and knowledge for water quality work is learned on the job, 60% reported additional formal training on the job, and growth of knowledge and work-related contacts have both increased. So, we can conclude that the element of tacit knowledge is increasing, and is important.

The article quoted above makes a comparison between office-based rule and permit writers and field-staff roles. Promulgating general pollution requirements and then relying more on field-staff roles implies not only a shift in emphasis and an increase in training, but also that the increase in tacit knowledge can be applied even-handedly. This type of shift may be helped, for instance, by the kind of build up of social structure suggested in our discussion of occupationalizing processes.

A good deal of this recent complexity we have described is due to increasing mandates or encouragement in existing strategies to be "cross-cutters" - making contacts with other sections to check on EIS compliance or relevance to laws and work jurisdiction matters in other sections. That is, a lot of the complexity is legal, regulatory, bureaucratic and

organizational knowledge involving office work and paperwork. This may explain the perception of both grass roots critics and some DNR water quality workers that the DNR "is becoming a paper bureaucracy."

On the other hand, in addition to the increase in legal and organizational knowledge, ecological and environmental knowledge is also growing. Eighty-four percent of our sample report attendance at meetings of professional associations are needed. So, some extent of tacit knowledge is also increasingly felt to link to the base of knowledge. In circumstances where a partially emerged occupation is influenced by a continuing social movement (external developments) and by continuing growth of the knowledge base (internal developments), we might predict further efforts at occupationalizing. Circumstances of this kind call for extensive and continuing communication between practitioners and university or other training programs in order to ensure their relevance to actual occupational conditions.

We argued in our introduction to Chapter 3 that, historically, "the environmental movement may be seen to have transformed water quality organizational activity from a relatively 'closed rational' to an 'open natural' (work) environment. "Open natural" models include ongoing organizing, and negotiated order models on the social-psychological level; and resource dependence, institutional theory, and organizational learning on the ecological level (Scott, 1987, 105-115). On a structural level water quality work environments remain partially 'closed rational': examples include bureaucratic program slots, rules and regulations, civil service job classifications, public servant neutrality, and a current fiscal crisis resulting in a cost-cutting, productivity orientation. On the other hand, one of the consequences of a long-term historical shift in water quality work from engineering to environmental perspectives has been that, on a structural level, in a complex, rapidly changing environment, an open-natural model influenced occupation may be in a more dynamic job design process (Cardy & Dobbins, 1992).

One of the weaknesses of the job characteristics model (Hackman & Oldham, 1980) in job redesign literature is that the impetus for job enrichment or job redesign comes from "management." However, in a PISMO process model of "occupationalizing" significant influence for job redesign can come from external societal context dimensions, such as a continuing impact from a broad based social movement helping to redesign the task variety, task identity, task significance, autonomy and feedback.

The increasing structural complexity of water quality work is a consequence of both immanent developments, work site complexity, and importantly the initial and continuing influence of the environmental movement. Thus, in conclusion, we can note again that the complexity dimension of initial attributes of the position and the direction of change in the position as the position becomes an occupation are significantly influenced by the environmental movement. Thus, while water quality work has become more complex and holds the potential in both an increasing body of knowledge and growing tacit knowledge to become like the classical professions, environmental management more closely resembles the "new, mixed professions" initially described by Wilensky in 1964, at an early point in the emergence of the new social movements.

Our research question #11 was: "To what extent has the position developed the characteristics of Wilensky's 'new mixed profession' or 'program professional'?" The notion of the program professional emphasizes an emerging occupational orientation in which professional goals and organizational goals are blended with and driven by social movement goals. Our research finds a strong mission orientation among our sample and we have noted how mid-Michigan water quality workers pay increasing attention, or wish to pay increasing attention, to the growing ecological knowledge that is closely connected to the mission knowledge base. There is a high degree of contact with the public. Over half report increasing contacts with environmental groups. Many in the sample give environmental movement-influenced reasons for applying for their work. They read

scientific and issue-oriented environmentalist publications. They identify themselves with a program professional type of movement-influenced occupational label: "environmental managers," or "environmental protection." Several participate in environmental organizations, community, or other civic activities, establishing loose networks in the wider community.

All of these findings are evidence of a mission orientation suggesting that the development of a program professional orientation in water quality work is a tenable hypothesis. With regard to the importance of the program professional, Wilensky noted:

The occupational group of the future will combine elements from both the professional and bureaucratic models; the average professional (person) will combine professional and non-professional orientations; the typical occupational association may be neither a trade union nor a professional association . . .

Occupational structures now emerging have their individual correlates. As the data above suggest, the role orientations of many professionals reflect a resolution of the clash between the requirements of profession, organization, and social movement.

. . . the neutral and objective service of the "technical professional" will be mixed more and more with a sense of program, of long-run goals and possibilities. In many a corner of the bureaucratic machinery of modern society, one finds what I have elsewhere labeled the "program professional" - the specialist in depth (e.g., experts in social insurance, rehabilitation, public assistance, public finance, housing, race relations, labor disputes settlement) whose professional competence and commitment are beyond question, but whose commitment to particular programs and policies (e.g., health insurance) is just as strong. By virtue of his technical prowess, he makes himself indispensable as a policy adviser. In his job moves - between government and private agencies, civic organizations, foundations, universities - he follows the programs to which both his skills and his social philosophy are bound. The labor staff expert striving to "keep Labor left" supplies ideology and programs for community relations and national political action, the caseworker or groupworker who becomes a supervisor or administrator broadens his ties to the larger community of pressure groups and politicians, and can thereby engage in social action on behalf of his profession. These have their counterparts among lawyers working for minority defense agencies and civil liberties organizations, social scientists working for government agencies, political parties, and congressional committees. End products of broad social movements of social reform, these (persons) combine professional standards of work with programmatic sense and constitute an important link between professional culture and civic culture, the (person) of knowledge and the (person) of power (Wilensky, 1964, 157-158).

For those clean water managers who may find in this description of emerging "policy staff experts" a reflection of their own identity as

program professionals, some of the questions about "occupationalness" this case study raises may seem germane. Our main focus on build up of social structure and occupational consciousness has identified a model of reciprocally reinforcing processes leading to and furthering, such build up.

Social supports are helpful to accomplish policy or program goals. We have located many facilitating variables that are, to different degrees, present in the work environment and social context of water quality positions. These facilitating social conditions can lead to the build up of social structure which, in turn, could lead to further build up of occupational identity. These phenomena can contribute to the accomplishment of program goals.

Our case study describes the results of an occupation showing partial emergence. We started with an occupational model of a social movement influenced origins effect, initial attributes, and direction of change for the legally enacted initial clean water positions. We documented how this position has, in part, emerged from pre-existing positions. Moderating variables facilitating a direction of change in the initial position toward becoming an occupation were located and described. These variables included: strong sense of mission, continuing movement pressures, resource availability, growth of knowledge, rapid change, increasing complexity, and new sets of problems. We modified our original model to include additional dimensions such as the potential influence of generational and job cohorts, emerging organizational field dynamics, specific historical interactive effects, and the possibility of the development of program professionals in clean water work. A reciprocally reinforcing process was identified in which the build up of occupational identity, influenced by these additional dimensions and moderating variables, has led to additional build up of occupational structural supports. Results of this study conclude, however, that this reciprocally reinforcing process has led to a partially emerged occupation: there is a

general occupational identity, strong issue-orientation and the build up of university and training programs and scientific publications and activities, but very little build up of specifically water-related occupational support structures. The clean water manager is a type of work currently showing partial emergence - it is a partially emerged (PISMO) social movement occupation. Understanding this characteristic of partial emergence can benefit from locating specific histories, specific models, and specific (PISMO) processes. Utilizing these processes in an applied way can contribute to environmental and occupational goals.

FOOTNOTES FOR CHAPTER 2

1. Discussion about "where environmental management 'program professionals' will go" to "make a life" will be presented in the Conclusion (Chapter 4). The current societal emphasis (or return of the design perspective) on the environmental dimensions of the political economy, including industrial design toward environmental production processes and products, on an overall basis, reflects a "rational myth" process similar to the "origins effect" of the 1970s Clean Water Manager story. Twenty years later first and second cohort incumbents of environmental management roles witness a similar expansion of environmental consciousness and a similar "limited critical reform" activity. Their "social problem occupationalizing processes" are continuing.

Without attention to consumer durables, however, the current interest in recycling, remanufacturing, redesign and reuse/less use will miss the mark: population and level-of-use linked to consumer durables will perpetuate conditions requiring environmental management. The next phase in the design perspective is already happening: significant rethinking and redesign of consumer durables - buildings, houses, cars, appliances. This appears to be a remedial attempt to stop short of significant reduction in overall use of consumer durables.

This "limited critical reform" around the strategy of recycling, and goals of sustainable economy as a limited integration of human ecology and political economy design process, combined with continuing movement pressure to maintain a "permit system" all make roles for environmental management "program professionals." As, mentioned, the "social problem occupationalizing processes" will continue to make jobs, to make processes of occupationalizing possible. But the social ecology will not make the transition (from a technological to an ecological paradigm) without significant advance on the issue of consumer durables. This seems improbable.

Recycling durables, remanufacturing durables, and replacing durables with better designed durables retains the three major sources of pollution: chemicals, energy and auto plants. And, of course, there are plenty of other purely ecological things to think about. How will the steady work of environmental management "occupationalize" into the issues of closing local job-producing factories down? What will the problems of "ecological structural unemployment" look like without communal forms?
2. Lemert (1951) theorized that the "societal reaction" to conditions that defined them as "social problems" was measurable in terms of some kinds of thresholds. Wilensky and LeBeaux (1958) placed the societal reaction to industrialism, urbanism and capitalism in the context of national social and cultural condition influencing the human-welfare movements and their reform activities, jobs and occupations. McKee (1970) observed that

consciousness of situations as problems was occurring in the 19th century with the transformation to industrial capitalism and that this societal consciousness of "society as problematic" has fueled to growth of social knowledge generally, and been the origins of sociology in particular.

3. Polanyi (1944) describes in a masterful history the nature of the "defensive reaction" of masses in the rise of industrial capitalism. Specific social movement formations occurred in response to or as a societal defense against the tendency in industrial capitalism to push pure market relations to the forefront. The labor movement is seen as critiquing the "fictitious commodities" of land, labor and capital, defending the social construction of value and meaning of the land, the people and the surplus. Conrad and Szelenzyi, (1979) observed that in extreme central planning on the later Leninist and Stalinist models the party officials power and prestige rode on size of the budgets and the number of employees under their projects. This tended to favor emphasis on big ticket public durables: dams, factories, railroads, defense or military spending. Consumer items were low in priority. The specific social movement formation in centrally planned socialism (or authoritarian communism) took the road of societal defense against this power and prestige process of party officials as it linked to consequences in the consumption levels (housing, store goods, or new products). Offe (1985) has analyzed the balance in tensions of market and non-market dynamics in a general set of essays critiquing the contradictions of the welfare state. It is clear that many partially institutionalized social movement jobs and occupations emerged in the welfare-state context.
4. Scott (1983) describes a set of five general societal processes that have characterized recent broad social reform movements.
5. For the purpose of studying the emergence of roles in the environmental movement we are going to focus on "societal reaction movements." There will, of course, have been many institutionalizations of new jobs in the formation of counter-movements. For example within the feminist movement there has been diversion with the formation of a counter-movement (eg., pro-choice versus right to life). The emergence of occupations in both partially institutionalized social movement job spheres may take similar paths and use similar processes, and of course they interact with each other. But there may be some dynamics that are different in "societal reaction" versus "conservative" or counter-movements.
6. Catton (1977) locates the transition from sustainable industrialism to the point beyond carrying capacity in terms of level of living (eg., how many and type of consumer durables per person) and argues that historically this point was reached by about 1910 living standards. Piore and Sable (1984) argue that the "small holdings" experience of Americans in the 19th century does continue as a "block of culture" in our traditions. Their interpretation of the technological trajectory toward "flexible manufacturing" makes them hope for a "yeomanry

democracy" of smaller and medium sized firms. However the trends toward global economy (including certain industries, such as auto, energy, and chemicals becoming true multinationals) makes any national, artistic and ecological solution difficult without leads toward how to reduce use of consumer durables (See footnote 1).

7. "Non-market" is a tepid word and may not in itself lead us anywhere except away from the culturally dense institutions of market formations (Gramsci, 1977; Berger, 1989). The embeddedness of social relations in market and quasi-firm relations has been analyzed carefully by Granovetter, 1985. What is needed is a term for non-market "densities" that is not defined by a negative comparison. Part of the reason for this is that the limits of the public economy surely have reached some cultural barrier or threshold - public planning beyond "51%" of the economy makes less and less sense to more and more people. Since it is not clear where to turn, and since the "non" market view of public economy does not stimulate clear cultural feelings (or resonances of structures of sentiments) in any way that can assume more planning per se will solve political dilemmas, it seems important to specify the working "blocks of culture" in the public sector better. "Occupationalness" is one of these working "blocs of culture" that people can identify with: a partially institutionalized social movement occupation or organization has social and cultural links between its practitioners and its knowledge and its social base. The "defensive reaction" movements have built up this "public sphere" culture, the "social problems occupationalizing processes" and the conditions for their continuation into the future make the study of the emergence of "non-market" occupations a contribution toward developments in the social order.

Finally, the articulation of a "mixed economy" model also makes us conclude that the unexamined (20th century) liberal bias of the social sciences had its premises in a social order that has now changed. Many people have to make decisions to work in the market sector. PISMO processes are at work in the private sector labor market as well as the public sector, and the dilemmas suggested here will be working themselves out in both market and non-market contexts, and in the linkages between them.

8. The role of "professional amateur" is well cultivated as a "block of culture." The strategy-of-action is to reward certain individuals for following and being interested in certain issues and organizing possibilities without making a labor market position. Notice the important relationships between the anti-institutional "amateur" citizen spokesperson who is knowledgeable and the PISMO role incumbent who is acting out the "social problem occupationalizing process" - the two roles complement each other and both are needed.
9. Gouldner in his short book Enter Plato (1965) indicated the classic relationships between the academy and political dynamics in ancient Greece as part of the Western tradition. Disinger and Schoenfeld, have reviewed the rise of environmental studies programs from the mid-1960s to the date of their publication (1987) and note that while there have been ups and downs in several programs, overall there has been continuing support for funding and budgets

and that enrollments have continued. In academe "environmental" and "resource development" departments are linked to environmental management roles and there is much interaction.

10. The fact that the environmental movement has been a continuing influence interacting with resistance from vested interests (Schnaiberg, 1980; Hannigan, 1986) to wrest resources indicates how analysis must "sharpen" on the conditions for new organizations (and new organizational form) survival.
11. Berger and Luckmann are dealing with rather basic institutional levels and may be forgiven if they "pass on" quickly from the building up of institutional worlds that exist in statu nascendi for only one generation and are then passed on to children. The point they want to get to is the quality of objectivity: that "the institutions" (eg., "fatherhood") have been crystallized

. . . over and beyond the individuals who "happen to" embody them at the moment. In other words, the institutions are now experienced as possessing a reality of their own, a reality that confronts the individual as an external and coercive fact (Berger and Luckmann, 1967, 58).

Berger and Luckmann's review of the "three dialectical moments" in social reality is informative. They remind us that society is a human product (externalization), that society is an objective reality (objectivation), and that man is a social product (internalization or socialization). However the emphasis in their work is strongly on the objectivation moment of the dialectical threesome. In "turbulent times" (Swidler, 1986) externalization increases as movements utilize parts or "blocks" of past culture and externalize or build new typifications and habits, all in a newly altered or shaped "block" that then, at a later, more placid time becomes "culture" or taken-for-granted "institutions" as they are. With frequent waves of turbulence these blocks of culture over recent centuries have been increasingly subject to remodeling.

12. Berger and Luckman observe that the institutional meanings must be:

. . . impressed powerfully and unforgettably upon the consciousness of the individual. Since human beings are frequently sluggish and forgetful, there must also be procedures by which these meanings can be reimpresed and rememorized, if necessary by coercive and generally unpleasant means. Furthermore, since human beings are frequently stupid, institutional meanings tend to become simplified in the process of transmission, so that the given collection of institutional "formulae" can be readily learned and memorized by successive generations (Berger and Luckman, 1967, 70).

As a description of age-old institutions this rendering is unexceptional. However where did our "history" go? The theoretical part of their treatise on the sociology of knowledge has left out the important contribution that a single generation can make to institutionalizations with such

a quick "passing on" of what has been "built-up" to the next generation. Within less than a generation the environmental movement has built-up to the brink of a fundamental challenge to basic institutions and is partially institutionalized as a significant paradigmatic shift. Thirty years ago this degree of challenge and the powerful suggestion of further educative change would have seemed "utopian." This does not vouchsafe that terrible, almost ineluctable problems confront us. But it does indicate that more emphasis on processes, scopes, and types of institutionalizations as emerging processes would help turn the needed focus toward the needed changes.

13. However, so much of the institutional order seems to already have historicity and facticity in Berger and Luckmann's treatise that the utopian potentials emphasized by Mannheim seem to have no place at all. For instance under their discussion of "legitimacy" the conceptual machineries of universe-maintenance are seemingly always reactive, there is no place for a paradigm shift. They note:

If the institutional order is to be taken for granted in its totality as a meaningful whole, it must be legitimated by "placement" in a symbolic universe. But other things being equal, this universe itself does not require further legitimation.

. . . All legitimations (can be) described as machineries of universe-maintenance (Berger and Luckmann, 1967, 104-105).

Berger and Luckmann list four possible types of legitimations where "legitimation" is defined as a "second order" objectivation of meaning.

Legitimation produces new meanings that serve to integrate the meanings already attached to disparate institutional processes (Berger and Luckmann, 1967, 94).

14. At that point, as we have seen, the self-evident character of the institutions can no longer be maintained by means of the individual's own recollection and habitualization. The unity of history and biography is broken. In order to restore it, and thus make intelligible both aspects of it, there must be explanations and justifications of the salient elements of the institutional tradition. Legitimation is this process of "explaining" and justifying.

Legitimation "explains" the institutional order by ascribing cognitive validity to its objectivated meanings. Legitimation justifies the institutional order by giving a normative dignity to its practical imperatives. It is important to understand that legitimation has a cognitive as well as a normative element. In other words, legitimation is not just a matter of "values." It always implies "knowledge" as well. . . . Legitimation not only tells the individual why he should perform one action and not another; it also tells him why things are what they are. In other words, "knowledge" precedes "values" in the legitimation of institutions (Berger and Luckmann, 1967, 94).

15. Berger and Luckmann note:

Because of their complexity and differentiation, they are frequently entrusted to specialized personnel who transmit them through formalized initiation procedures (Berger and Luckmann, 1967, 94).

Berger and Luckmann elect to offer the example of "an elaborate theory of 'counsinnhood', its rights, obligations and standard operating procedures" as an explicit theory.

16. They note:

The crystallization of symbolic universes follows the previously discussed processes of objectivation, sedimentation and accumulation of knowledge. That is, symbolic universes are social products with a history. If one is to understand their meaning, one has to understand the history of their production (Berger and Luckmann, 1967, 97).

Continuing with this theme in a later section, they stress:

. . .No "history of ideas" takes place in isolation from the blood and sweat of general history. But we must once again stress that this does not mean that these theories are nothing but reflections of "underlying" institutional processes; the relationship between "ideas" and their sustaining social processes is always a dialectical one . . . all symbolic universes and all legitimations are human products; their existence has its base in the lives of concrete individuals, and has no empirical status apart from these lives (Berger and Luckmann, 1967, 128).

If a social movement has been a good part of the work life of incumbents or members of such "subsocieties" then the story of emergence processes has more salience. Many of the recent broad social movements of social reform have involved the founding of new institutionalizations (gender role, racial relations, age typifications, quality of work life, mental health, environmental relationships). For Berger and Luckmann "subuniverses" of meaning (like all social edifices of meaning) must be "carried" by a particular collectivity,

. . . that is, by the group that ongoingly produces the meanings in question and within which these meanings have objective reality (Berger and Luckmann, 1967, 85) (See also Mannheim on generations, 1935).

This is the particular history we need to help focus on how institutionalizations objectivate through which social processes. It is true that as soon as institutions exhibit sufficient sedimentation and historicity to be transferred to the next generation as "objective" social order, as social fact, that at that stage, for the next generation, society as human product has become society as objectivity and the institutions are there to be internalized. If we cannot understand an institution unless we understand its history the underemphasis Berger and Luckmann give to the dynamic

processes of social change that bring into social orders a reformulation of types of foci (communication, labor, sexuality) seems misplaced.

17. As Berger and Luckmann say: "The relationship between ideas and their sustaining social processes is always a dialectical one" (Berger and Luckmann, 1967, 128). In terms of Berger and Luckmann's four "levels" of legitimation we might recast the sources of emerging organizations (in this case environmental organizations) as a specific build-up.

Incipient legitimation is present as soon as a system of linguistic objectivations of human experience is transmitted. For example, the "trouble" at Santa Barbara with the oil spill was "private disregard for ecological safety" resulting in oily birds and a ruined beach. Or spring will soon become silent because of DDT in pesticides killing birds "due to the private decisions on types of chemical use without public monitoring or concern." The simple traditional affirmation that "this is how things are done" exists in the system of linguistic objectivations that typify the behavior as a private activity versus public good phenomena. "Why" things are done this way is given a pretheoretical response: this is the self-evident "knowledge" on which all subsequent theories must rest: "This is a public problem." It is in this sense that Cohen's (1983) reflections on social movements places the environmental movement in the "modern tradition" of working in the "public sphere."

The second level of legitimation contains explicit theories by which an institutional sector is legitimated in terms of a differentiated body of knowledge. The "frame of reference" for the environmental sector of institutionalized conduct during the mid-1960s and early 1970s during its inception becomes an explicit theory of the "new federal model" described by Scott in his analysis of the origins of Area Agencies on Aging organizations:

As Binstock and Levin (1976) have argued, this approach to the problem of aging is consistent with a quite general model of federal action, which first appeared in the 1960s during the Kennedy and Johnson administrations. . . . Common elements in these programs that deal with a large variety of problem areas - for example, poverty, urban renewal, and health care - include the following:

- (1) "a distribution of funds to state and local entities with only the most general rules about what should be done with the distributed resources . . . The substantive responsibilities of these implementing entities are usually described in the most general of terms: develop services and comprehensive plans; coordinate; undertake advocacy" (Binstock and Levin, 1976, 519).

- (2) the distribution of funds not to existing organizations but to "newly designated or newly created implementation entities" (Binstock and Levin, 1976, 520).

(3) federal requirements that provision must be made for substantial participation in policy decisions at the state and local levels by members of the client population in the service area.

. . . the creation of new entities to carry out these programs is consistent with more recent views on organizations, which stress limitations on the capacity of existing organizations to adapt to new circumstances or to accept new assignments (see Hannan and Freeman, 1977). It is easier to create new organizations to carry out new functions than it is to modify or transform existing ones (Scott, 1983, 123-124).

In the case of the WWTTP grants program (1972 as amended in 1977) this model was significantly altered in that instead of "only the most general rules" about what should be done with the distributed resources was revised to very specific, highly technical construction and water quality standards. It is in this sense that Meyer and Scott argue that the environmental "societal sector" is high technical/low institutional. We agree that the grants program has helped a highly technical interorganizational field emerge but disagree about the evaluation of how institutional the environmental sector has become.

18. Rowan cites Emery and Trist (1965) who saw all the large organizations marching across the bridge together setting up turbulence because of their size, market power, and need to compete and cooperate. Because of these "environmental turbulence" (or turbulent field) characteristics added institutionalist social controls on the mythic level are required: big bureaucratic organizations with all the correct forms do it right (solve problems).
19. This is a similar question to the one asked by the early 1960s debate around professionalism which saw the encroachment of organizational controls on free, professional normative controls.
20. We have already noted Bucher and Strauss's work on social movement like "segments" within "professions in process." Of course, social movements largely external to any existing profession may arise and create the conditions for a new occupation. We have argued that this may well have occurred in many cases in recent decades and suggest that when Abbott invokes the question of "what kinds of external authorities are invoked to support the various mechanisms of the division of labor and when that he follow Poulantzas (1973) lead in noting that social movements have adherents, followers, individuals with role orientations that are strongly influenced by social movement originated goals within the state and political order.

Abbott recognizes this problem by noting that in his adumbration of how competition around abstract knowledge within existing professions:

. . . Nothing so far allows for change in the system. But of course forces for change continually impinge on it. There are changes in knowledge; new ways to treat old problems, new ways to construct new problems. There are changes in quantity and quality of professional

service, some arising in new forms of professional organization, others in accidents of professional demography. There are whole new types of problems, enticing professions from prior work.

Changes in legitimating values may suddenly disadvantage some professions while privileging others. All of these forces impinge on a structure that is already tight, in the sense that each profession has enough work for its current resources, laid out over a particular mix of jurisdictions. . . Since outside forces bear on the system continually, the system changes through continuous reshuffling, jostling, extension, and retraction. All this established a division of labor, an allocation of tasks among the various professions (Abbott, 1989, 278).

21. Abbott (1989) notes that the activity of consumption that takes products and services back into households and other consuming units has made consumption a necessary part of the division of labor - as necessary as is production:

. . . in particular, certain forms and extents of consumption are necessary to organizational dominance of the division of labor. The organizations dominating the modern division of labor have a great interest in overproduction, which has led them to work hard to develop an "occupation" of consumers. . .

. . . (this is shown) in the restructuring of mass distribution. Chandler (1977) has shown the gradual replacement of local distribution in America first by wholesale jobbers, then by department stores and mail-order houses, and finally by chain stores (Abbott, 1989, 284).

Of course, many new jobs and occupations emerged from this transformation of the means of distribution, including from Chandler's perspective a functional explanation of the rise of a managerial strata along with all the jobs in the new marketing channels (see Mills, 1956). Abbott makes an additional point about the social relation of private consumption missed by economists and marketers (who see "consumer sovereignty" or "consumer behavior" from certain set premises). Abbott notes that this gradual "winning out" of the retail department and chain stores (over the local jobber and mail-order houses) involved transforming consumption:

For while both the latter (department and chain stores) lowered consumer prices, both required consumers to provide more of the final transportation of the goods. Consumers were willing to pay these costs - the carfare to get to a central city department store or automobile costs to reach a suburban chain store - merely because of the lowered prices, there being little immediate increase in the available variety of goods. The new distribution forms made consumers do some of the work previously incumbent on the corporation or its agents. Fast food chains, supermarkets, an self-service gas stations merely take the process one step further.

Very much as in Burawoy's (1979) analysis of shop floor practices, the consumer is induced to work for the organization by means of a game. In order to "make

out" as consumers - to acquire goods and services at lessened expense - purchasers pay some of the final costs of transporting the merchandise (Abbott, 1989, 284-285).

This phenomenon, along with shopping, information search, and "endless gossip" (about products and services) serves a latent function of "maintaining organizational dominance of the division of labor."

22. Abbott notes:

The 12 years spent in school by most citizens in modern countries clearly provide the implicit model for later industrial relations. That within student bodies there is no real analogue for occupations - indeed for the division of labor itself - may explain why occupations have weakened in modern, "educated" labor forces.

Education is the main girder supporting modern staffing structures; therefore understanding its relation to occupations is essential. . . . But in general, even professional education seems as much a winnowing tactic as a teaching of necessary materials. The general college curriculum is even more clearly a winnowing tactic. . . (Most) will be taught what is necessary on the job, much as professionals are. . . . Aside from elite universities and colleges, which continue along paths set long ago, modern educational systems have come largely to serve the staffing functions of allocating and assorting social groups in to the world of work, where they will then be trained and directed by large organizations (Abbott, 1989, 285).

23. We use the word "partially" in the definition of the PISMO work region because there are anti-institutional dimensions of social liberation movements, waves of uninstitutionalized change in cultural movements, hidden or only partially institutionalized roles in revolutionary movement traditions, and specific conditions making for recurrent innovations, agendas and mandates in social reform movements. None of these aspects are part of the primary focus of this study which is on the emergence of water quality occupations. I am indebted to D. Morrison for pointing out the distinction between "institutionalization of a social movement into jobs and occupations" and "partially institutionalized" social movement jobs and occupations.

FOOTNOTES FOR CHAPTER 3

1. With regard to Smelser's model, we see the collective behavior "value-added" approach as a method of focusing on the additive, multiplicative (and dialectical) sequences relevant to the processes of occupationalizing.
2. In Chapter One we emphasized that this research is oriented toward hypothesis generating rather than hypothesis testing. Our attempts later to generalize will be based in part on plausible hypothesizing and in part on the data we have been able to muster.
3. The State of California has instituted its own "State EPA." As a fragile ecology with little water, vulnerable specialty crops, the second largest agricultural region in the world outside the US midwest, unparalleled in scenery and outdoor recreation in mountains, hills, rivers, streams and beaches and oceans, and beset by massive immigration and population growth, California has been a bellwether state for many trends - and importantly in the area of the environment. Research on the role of states and their policies, in any larger study of the "occupationalness" of environmental managers, could locate important subtleties in the processes.
4. The relationship of recessions to public policy persists as a dilemma for the environmental movement. "Earth Day's growing pains: Environmental movement making slow headway in poor economy," is the lead for a local Michigan frontage story (Lansing State Journal, April 22, 1992). A larger study could develop hypotheses and research on this relationship (recession and "occupationalizing"). Crises and conjunctures may figure into the conditions for developing or furthering an occupation. This topic will be taken up in a brief manner in parts of Chapters 3 and 4.
5. During the summer of 1991 assignments for the Surface Water Community Assistance (municipal facilities) project managers included "wrapping up" the remaining WWTP grants projects, and they have been training for the new state revolving fund loan project manager role. Final wrap-up and phase-out plans for each project still under the grants program were being sent to EPA all during 1991 and 1992.
6. The responsible party for EPA in the delegation agreement is the Unit Chief, Municipal Facilities Branch of the Surface Water Division. The responsible party for the Michigan DNR is the Section Chief of the Municipal Facilities Administration Section, Community Assistance Division.

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APPENDIX

WATER QUALITY MANAGEMENT SURVEY

Dear State Employee, my name is William Tregea. I am a Ph.D. candidate in the Department of Sociology at Michigan State and am conducting a survey as a part of a study of environmental occupations. Most of the people in types of work related to Michigan water quality employed in the Michigan Surface Water Quality Division of MDNR are asked to respond. Please complete this survey within a week, if you can. It will not take much of your time. Although an identification number appears on the questionnaire for control purposes, you do not need to identify yourself by name. The data will be reported in aggregate or composite rather than individual terms. Although we do not anticipate that you will have any objection to the kind of questions being asked, all information will be confidential. Please use the blank space labeled "comments" at the right hand margin for observations, clarifications, or additional space. Thank you for your cooperation.

COMMENTS

1. What is your civil service title and your job duties?

(job title)

(job duties)

When did you start in this position? _____ (date)

2. What made you decide to apply for this work? _____

3. What have been the higher education degree(s) you have obtained? PhD ____ JD ____ MA + ____ hrs MA ____ MS ____ BS ____ BA ____ (check). In what fields were your degrees? (give dates received) _____

Have you had any additional specialized training(s)? ☐ yes
☐ no. If yes, what? _____

One of the purposes of this study is to find out how people become employed in water quality related environmental management. Please help us to do this by telling us about your career history.

4. Beginning with your last previous employment, please describe briefly your previous fulltime jobs:

COMMENTS

(job title) (job dates) (job duties)

(job title) (job dates) (job duties)

(job title) (job dates) (job duties)

[If you need additional space please write more below]

5. How long have you been in water quality work? __ yrs
6. Does your present job relate to your degree(s)? __ yes __ no
- Of the skills and knowledge required for water quality related environmental management work, how much of that knowledge did you learn on the job?
- [] almost [] a great [] some [] very
all deal little
7. Of the water quality position(s) you have had, do you feel the training you had prior to entering those positions was:
- [] adequate [] somewhat [] somewhat [] inadequate
adequate inadequate
8. Have you had any formal training on the job? [] yes [] no
If yes, please describe: _____
- _____
9. For the jobs in water quality you have had, how strongly do you feel that:

COMMENTS

A) more specialized academic training prior to entering the work is needed?

☐ very much needed ☐ much needed ☐ somewhat more needed ☐ not needed

B) continuing education on or off the job is needed?

☐ very much needed ☐ much needed ☐ somewhat needed ☐ not needed

C) attendance at meetings of professional associations are needed?

☐ very much needed ☐ much needed ☐ somewhat more needed ☐ not needed

10. We are interested in whether you have seen any changes in the water quality related jobs you have held?

A) To what extent has there been an increase in types of knowledge required?

☐ very large increase ☐ large increase ☐ somewhat of an increase ☐ little or no increase

B) Below are several types of knowledge required in your job that may have increased. How would you rank them in terms of how much each has increased, in order ("1 to 3"):

<u>Type of Knowledge</u>	<u>Rank</u>
Environmental/ecological	_____
Legal/regulatory/organizational	_____
Technical/engineering	_____

Has there been a decrease in knowledge required in any of these three types? ☐ yes ☐ no. If yes, can you comment?

C) To what extent has there been an increase or decrease in the amount of paperwork required?

☐ very large increase ☐ somewhat of an increase ☐ no increase ☐ decrease

D) To what extent has the amount of contact with external environmental lobbies and/or pressure groups changed?

☐ large increase ☐ some increase ☐ no change ☐ some decline ☐ large decline

COMMENTS

11. What other kinds of changes do you perceive in the nature of your water quality related job(s) over recent years?

12. Check which of these issue-oriented environmental organizations or associations you now are or in the past have been a member:

<u>organization</u>	<u>now</u>	<u>past</u>	<u>organization</u>	<u>now</u>	<u>past</u>
Ntl Wildlife Fed	___	___	Greenpeace	___	___
Sierra Club	___	___	Environmental Defense	___	___
Audobon Society	___	___	Clean Water	___	___
Cousteau Society	___	___	The Nature Conservancy	___	___
Wilderness Society	___	___	Mi. U. Con. Clbs (HUCC)	___	___
Ducks Unlimited	___	___	Nat. Res. Def. Council	___	___
_____	___	___	Friends of Red Cedar	___	___
_____	___	___	Friends Looking Glass	___	___
(other)	___	___			

13. Which of the following scientific-professional water related, or general environmental journals or sources of information do you subscribe to or consult regularly?

<u>journal</u>	<u>yes</u>	<u>journal</u>	<u>yes</u>
Am. Assoc. Adv. Science	___	Mich. Aca. Arts & Sci.	___
EPA Journal	___	Water Env. & Technolgy	___
WPCF Research	___	WPCF Bulletin	___
Annls. Assoc. Am. Geog.	___	Science News	___
Amicus	___	Energy Policy	___
The Envrnmtl. Professional	___	Jrn. Amer. Plan. Assoc.	___
_____	___	_____	___
(others)	___		

14. Which of the following work-related associations, interest groups, divisions, or occupational organizations do you now belong to, or have you in the past? (indicate number of yrs)

<u>organization</u>	<u>no. of</u> <u>years</u>	<u>organization</u>	<u>no. of</u> <u>years</u>
Water Pollution Cntrl. Fed.	___	Mich. Assoc. Env. Prof.	___
Assoc. Amer. Geog. Water	___	Amer. Planners Assoc.	___
Specialities Group	___	Mi. Prof. Empl. Soc.	___
_____	___	_____	___
(others)	___		

COMMENTS

15. Some people see their job as part of a larger occupation. For example, do your job duties include the whole range of activities included in what you regard as your occupation? If not, to what extent do you see your present or past job(s) as being part of an occupation that includes but is broader than your present job?

☐ to a large extent ☐ to some extent ☐ not at all

If you see your work as part of a larger occupation,

A) how would you describe your occupation?

(name of occupation)

B) What kinds of jobs are included in this occupation?

C) How long have you seen yourself as a member of this occupation?

☐ last ☐ last ☐ longer than
1-5 yrs 6-15 yrs 15 yrs

16. To what extent do you have work or work-related contacts with people within Michigan but outside your section?

☐ a large amount ☐ some amount ☐ very little
of contact of contact contact

A) To what extent are these contacts directly required by your job?

☐ a large ☐ some ☐ very few or
amount little

If any are required by the job, have these contacts

☐ increased ☐ stayed almost ☐ decreased
the same

If there has been any change, please explain: _____

COMMENTS

B) In your position, to what extent have you developed contacts outside your section, contacts not directly required by your job description (people you refer to, consult, see occasionally, phone for advice, keep up with, or rely upon for advice or knowledge, etc.)?

☐ a large amount of contact ☐ some amount of contact ☐ very little contact

C) Of any work-related contacts not directly required by your job, are any: (check as many as apply)

- 1) a result of participation in environmental organizations? _____ (check)
- 2) a result of common professional interests? _____ (check)
- 3) intended to improve your job performance? _____ (check)
- 4) due to community, civic, or other volunteer participation? _____ (check)
- 5) _____ (other)

D) Have you discovered new sets of contacts, over time, that are helpful?

☐ yes, definitely ☐ to some extent ☐ little new contact

If "definitely" or "to some extent," please explain:

E) What proportion of work-related contacts are required by your job; what proportion of such contacts were voluntarily initiated by you? (On a scale "0- 100%")

Required by job: _____ %
Voluntarily initiated by me: _____ %

17. To what extent do you have work or work-related contacts with people in other states or nations?

☐ a large amount of contact ☐ some amount of contact ☐ very little contact

18. Have contacts beyond the section influenced the development or the nature of your job or occupation? For example, does such contact help crystallize what water quality work is or what is required for the occupation?

☐ to a very large extent ☐ to a large extent ☐ some extent ☐ little or no extent

COMMENTS

Can you describe the nature of this influence over time on you, the nature of your job, or both? _____

19. Please state your age _____ yrs and gender ☐ M ☐ F

Please indicate whether you agree or disagree with the following statements.

20. I see my job as a profession like medicine or law.

☐ strongly agree ☐ agree ☐ disagree ☐ strongly disagree

21. The main reason I am in my present line of work is because of my commitment to environmental goals.

☐ strongly agree ☐ agree ☐ disagree ☐ strongly disagree

22. The organization for which I work is an excellent place to pursue my occupational goals.

☐ strongly agree ☐ agree ☐ disagree ☐ strongly disagree

23. I completely agree with the environmental goal of the organization for which I work.

☐ strongly agree ☐ agree ☐ disagree ☐ strongly disagree

24. I would continue to work for my present organization even if it did not fulfill my goals for the environment.

☐ strongly agree ☐ agree ☐ disagree ☐ strongly disagree

25. If I had to rank the importance to me of environmental commitment, organizational identification, and professional concerns, I would rank them as follows:

(put an "1" next to one ranked highest, a "2" next to the middle ranked, and a "3" next to lowest).

☐ commitment to environmental movement goals

☐ commitment to the DNR as my work organization

☐ commitment to environmental management as a professional career

PLEASE MAIL THE QUESTIONNAIRE IN THE ENCLOSED ADDRESSED AND STAMPED ENVELOPE.

Thank you for your cooperation.