

THE OCCUPATIONAL CULTURE OF FORESTRY AS
DESCRIBED BY HOLLAND'S VOCATIONAL
PREFERENCE INVENTORY AND KUHN'S
TWENTY STATEMENTS TEST

By

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PREFACE

This study was borne out of nearly eighteen years of practicing and teaching in the field of professional forestry. The opportunities and experiences I have had in forestry have been professionally rewarding and exciting. I want to express my thanks to those many foresters all over the country who so willingly gave of their time to provide the data for this study. It is my hope that we can make use of this introspective look at ourselves to strengthen and broaden our profession to the end that we attain full public recognition as professional land managers, capable of dealing with complex social and political decisions regarding the use of the nation's forest resources.

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CHAPTER I

INTRODUCTION

Purpose and Design of the Study

Today, the practice of forestry is more on the minds of the average American than it has been at any time in the last 40 years. The changing national economy, the press of social adjustment, the problems of environmental quality and the pressure of a growing population, on a fixed land base, all contribute to this increased awareness. The criticisms that are being leveled by conservation groups, wilderness groups, wildlife groups, forest product user groups, et al., are not totally directed toward the prescriptions of technology. While much of the mass media exposure is devoted to the so called clearcut controversy, at this time, the basic questions that are being raised deal with the forestry professions' ability to resolve conflicts that are of a political and social nature rather than of a technical one. In effect, the questions that are being raised focus upon the occupational subculture of the profession itself, i.e., the patterns of belief and the modes of thinking, and behavior that are characteristic of the group. The ability of the profession to deal successfully with today's issues, depends largely upon the personalities of those persons who are a part of it.

One of the basic responsibilities of a professional association should be to locate and encourage the most qualified neophytes (Steen, 1969). Academic qualifications are only one of the criteria that are

involved in such a search. Personality, interest, beliefs, capabilities and the like must also be considered. Before a recruitment strategy can be developed, it is essential to have some kind of an inventory of the present membership so that target groups can be identified. The success of any professional organization in today's complex society depends upon its ability to service a wide variety of specialized occupational roles. An a priori approach to recruitment may well lead to a narrowness which will affect professional performance. Such narrowness will make it difficult for the profession to respond to the changing times.

Statement of the Problem

There is some evidence that there is a dichotomy between the type of person entering the profession of forestry and the type of person needed to deal with the changing professional role. Briefly, this conflict can be described as the difference between persons who are interested in working with trees and animals as opposed to persons who are interested in working with people and groups of people.

As early as 1945, E. K. Strong (1945) focused attention on this dilemma. In a study of public administrators in the Forest Service, Strong indicated that the interests of district rangers and those of administrators differed to such a great degree that there was some question as to whether many of the district rangers could be or should be promoted to administrative levels. He further suggested that there was considerable question as to whether the Forest Service had sufficient numbers of younger men with administrative interests to provide adequately for the organizational needs in the future. He characterized

the differences as largely those attributable to differences in interest regarding working with people.

While this study is of considerable age and is organizational-specific, it focuses on the problem very well and makes the point that the interest-dichotomy-dilemma has been with the profession for a long time,

Historically, the most successful criteria for predicting occupational choice in forestry, and personality congruence has been that of having a "love for the out-of-doors." Markworth and Buttrick (1939), Bourdo (1954), Hart (1968), Frank and Kirk (1970), and I. I. Holland and Beazley (1971) are but a few of the many authors that have documented the out-of-doors syndrome. These authors have made some attempts to quantify their beliefs,

It is believed that the occupational choice of forestry is the pursuit of an avocational interest rather than of a professional commitment. This pursuit has resulted in the gathering together of a large number of persons who are essentially nonconsensual (Spitzer, Couch and Stratton, 1970) in terms of their social anchorage and who have selected forestry because it was perceived to require little social interaction. The resultant overloading of the profession with one personality type due to the laissez faire recruitment tactic produces the frustration evidenced in much of the literature regarding professional forestry's inability to deal with the social-political issues of the time.

Purpose of the Study

The purpose of this study was twofold. The first was to describe two groups in the Society of American Foresters in terms of certain

demographic categories such as home town size, religious preference, political preference, etc. The second was to describe the sampled groups in terms of the personality characteristics established by J. L. Holland (1966) and S. Spitzer et al. (1970).

While the characteristics are not to be considered qualitatively, i.e., the goodness or badness of the findings, a clarification of the occupational culture as described by them will be useful to a large segment of the profession as it attempts to work out its role in society over the next thirty years. An adequate description of the occupational entrant and his more experienced counterpart seems essential in helping to evaluate needs in recruitment, in curriculum development and in public relations programming.

Objectives of the Study

To accomplish the purposes of this study the following specific objectives were established:

- 1) to describe the vocational occupants in each of two groups of foresters in terms of various demographic characteristics, and to determine if there were differences in the group responses beyond those of random chance;
- 2) to locate in the occupational entrant, and the practitioner with ten years of experience, the source for their social anchorage as determined by the Twenty Statements Test and to determine if there were differences in the group responses beyond those of random chance;
- 3) to describe the occupational entrant and the practitioner with ten years of experience, in terms of the J. L. Holland (1966)

typology and to determine if there were differences in the group responses beyond those of random chance;

- 4) to determine the validity of the Holland typology given for foresters (Holland et al., 1969) from a sample of vocational occupants;
- 5) to describe the occupational culture of forestry as measured by the responses in 1-4 above; and
- 6) to compare the adequacy of certain vocational counseling materials in the light of the occupational culture described in 5 above.

The research hypothesis for evaluating the data, regarding these objectives, was that there would be no differences displayed between the groups in any of the classification variables at the 95 per cent level of probability. It was further hypothesized that there would be no group differences in the response variables.

Rationale for the Study

Forestry literature seems dominated today by a concern for the professional image, by a concern for professionalism, and by concerns regarding what the professional role is and ought to be in the present and future society. Philip Briegleb (1965) summarized his understanding of foresters with the following list of what he called random reflections.

To different people a forester is:

1. a protector and perpetuator of the forest,
2. a timber butcher and despoiler of soil, water, and scenery,
3. a protector of wilderness,
4. a threat to the wilderness,
5. a fire fighter and tree planter,
6. a protector of wildlife,

7. an enemy of the deer and the trout,
8. a forester may even be a scientific manager of land resources who obtains the maximum combined benefits from them for all society.

Ellwood (1971) emphasized this rather negative image problem by stating that, "apparently the public thinks that the forestry arena is too important to be managed by forestry professionals."

Duerr (1970) has sharpened the focus of the problem by stating that "Foresters have lost the initiative in guiding man's use of land resources" The thrust of his position is that forestry is competing for leadership with persons trained in non-resource based fields but who have high levels of social articulation. He suggests that foresters are essentially isolated in their technology and in their professional culture and that they are out of touch with the social and political realities of the greater society. He traced the historical development of that isolation (Duerr, 1969) and showed how once evangelism was a major force in the subculture and how the pressures of economic shifts in the employment base, and the developing scientism caused a migration away from such an outgoing philosophy. Kaufman (1969) would describe this shift, in the Forest Service at least, as being brought on by factors of the organization such as social distance and the bureaucratic process.

In remarks made at the Roanoke Symposium on Forestry Education, Schroeder (1969) said that there was:

... a need to give more emphasis to seeking young men with the right capacities and recruiting them into forestry colleges rather than merely accepting those applicants who have the fee, meet the minimum requirements, and think they are interested in forestry.

This same point has been made by Ellwood (1971) in describing the forester of the future:

... the emergence of professional foresters like this from forestry schools will in large part be determined by the caliber and nature of the entering students and it is folly to think that four years of college can produce high quality managers or operational foresters, if the necessary inherent personal characteristics are not within the students. This focuses upon the need for greater selectivity in obtaining forestry students in the first place. Those that do not possess the necessary personal characteristics will be mediocre at best,

Both of these authors emphasize the importance of personality characteristics in establishing screening devices for entrance into forestry educational programs. Neither suggests criteria that should be used for such screens.

This study was conceived on the premise that quantitative data is necessary prior to the establishment of screening and recruitment programs. In fact, such data should be available to clarify the needs for such programs. The study was directed towards that part of the problem dealing with the personality constructs of some of the members of the professional group in hopes of providing the profession with a starting place that springs from quantitative data rather than opinion.

Assumptions and Limitations of the Study

In order to restrict and manage the size of the study, several assumptions had to be made by the author,

- 1) The first one was that the J. L. Holland theory of vocational choice, and its attending theory of personality constructs, is valid. There is a plethora of research reported in the vocational literature on choice theories and while there is considerable variance in opinions as to the generalizability of each, it is beyond the scope of this effort to test the psychological basis for the one selected.

- 2) It was recognized that all members of the profession of forestry are not members of the Society of American Foresters. It was assumed, however, that the membership is sufficient to allow for generalizations to the profession as a whole.
- 3) It was assumed that the respondents to the questionnaires gave a faithful representation of themselves in their responses.

Studies of this sort have some obvious limitations and these should be identified.

- 1) Typologies are useful indicators only and must not be construed as absolutes. Choice theories are global in nature and cannot be so tightly structured that they allow for individual categorization. When they are used in this way, they are elevated to a level beyond rational usefulness (Chapman, 1971) and lead to the manipulation of persons.
- 2) At the outset of the study, it was assumed that there would be a high correspondence between the date of initial job entry and the date of initial entry on the rolls of the Society of American Foresters. The assumption was not valid for the sample drawn in this study. This lack of correspondence caused a shrinkage of usable returns in the order of 53 per cent. Such a reduction in sample size limits the generalizability of the results.
- 3) The non-response to the mailed questionnaire was in the order of 45.9 per cent. Because of this, care must be taken regarding the breadth of generalizations made from the study.
- 4) Self-administered projective sampling techniques are frequently subject to increased sampling errors.

Every effort has been made in the course of this study to accommodate to these assumptions and limitations. It is not apparent that they have had a major effect upon the outcome of the study.

Definition of Terms

Occupational Culture--Refers to the patterns of belief, the modes of thinking and behavior that are characteristic of an occupational group. The patterns are conditioned and determined by the habitual activities and the cultural environment of the group. The concept includes the norms for the proper way of conduct and the sanctions that limit the activities of group members. It also includes the process by which the novice learns the culture (Overs and Deutsch, 1968).

Consensual Statements--Statements in response to the question "Who am I" which make unambiguous references to the membership in social groups and categories (Spitzer, Couch and Stratton, 1970).

Nonconsensual Statements--Statements in response to the question "Who am I" that lack references to social groups and categories (Spitzer, Couch and Stratton, 1970).

CHAPTER II

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

Introduction

Greenwood (1957) stated that the sociological approach to professionalism is one that views an organized group which is constantly interacting with society as a whole. The group performs its social function through a network of relationships to the greater society that are both formal and informal. The group creates its own subculture, and requires members to adjust to that subculture in order to obtain career success. This process of adjustment is critical for the profession in terms of its group life style. If the boundaries of the normative band are fairly narrow, there will be little room for deviant personalities, and the professional group will become quite provincial in terms of how it relates to the greater society. If, on the other hand, the normative band is wide, there is apt to be less provincialism but perhaps less cohesiveness also. He indicated that one of the principal functions of the professional school is to identify and screen out individuals who are prospective deviants. In his view, one important task for the schools is to provide test situations so that a neophyte's behavior and personality can be observed in terms of his response to the socialization process.

Duerr (1970) supported this idea when discussing forestry programs specifically. He stated that the schools were the guardians and the

transmitters of the culture. This places the responsibility squarely on the shoulders of the educational system. If forestry is not generating an adequate array of the various personality types required in the profession, then the schools must have some problems with recruitment, with the curriculum or both.

In professional forestry, there are many paths to career success, as is the case for any professional group. Levels of success are largely dependent upon the perceptions of the beholder. What might be considered a successful work history by one observer might not be so judged by another. There is a point, however, in most forest organizations that represents a plateau of success in most persons' minds. This is the position of district ranger in the United States Forest Service and the district forester in a private enterprise. These persons have obtained positions of considerable status both in their work environment and in the greater society. The position represents a major point in the forester's career development because it is the first administrative level where the conflicts of forest technology and its relationship to the social environment unfold. While arrival at this level in the occupational hierarchy may be the result of many different career paths over varying time sequences, the person in this position should demonstrate behaviors and abilities that are indicative of the modal professional practitioner's personality. In most organizations it is believed to take six to twelve years to reach this level.

Historical Studies of Foresters

The first evidence of an organized effort to look at the reasons behind forestry as a career choice dates to 1932. In that year Graves

and Guise (1932) published a comprehensive study of forestry education. In 1939 Markworth and Buttrick (1939) reported the results of a survey at the University of Georgia taken amongst the entering freshman classes in the forestry department. They asked their students two questions: (1) "Why do you want to be a forester?" and (2) "How did you become interested in forestry?" The tabulation of their results is in Table I.

This report is significant because it represents one of the earliest documentations of the outdoor syndrome. Brownstein (1940) reported similar results in a study at another institution. His questions were slightly different but the love-of-outdoors still elicited a 21.3 per cent response, which was higher than any other category.

E. K. Strong's (1945) study, has already been referred to. He did his work in conjunction with the development of the Strong Vocational Inventory Blank, a widely used occupational interest inventory. In his study he had 460 respondents, all of whom were employees of the United States Forest Service, 189 of whom were district rangers. It should be noted that at the time of this study the district ranger's job was quite different from what it is today. Over one-third of the 189 rangers reported their age as less than 30 years, indicating that the ranger's assignment was more nearly aligned with an entry level job than it now is. Another point that is important for comparison purposes is that over one-third of the sample had no college training. (The original data was collected in 1936 which accounts for the low educational attainment.)

Strong's study showed that, "... promotions in the Forest Service go to the men with lower interests in the mechanical pursuits and higher scores in general administrative interests." It is prophetic that he

TABLE I

WHY MEN ENTER THE PROFESSION OF FORESTRY

| <u>Reason for Forestry</u> | <u>% of Total</u> | <u>How Did You Become Interested</u> | <u>% of Total</u> |
|-----------------------------|-------------------|--------------------------------------|-------------------|
| Love of outdoors | 37.2 | Outdoor Interests | 22.7 |
| Good opportunities | 24.3 | Contact with foresters | 21.2 |
| Public service outlook | 8.3 | High school, boy scouts, etc. | 12.7 |
| Prepare for forest industry | 5.8 | Work in woods | 9.5 |
| Good background | 3.8 | Reading | 8.0 |
| Healthy life | 3.3 | Contact with others | 6.9 |
| Miscellaneous | <u>17.3</u> | Membership in C. C. C. | 3.7 |
| | 100.0 | Lack of other interests | 3.7 |
| | | Miscellaneous | <u>11.6</u> |
| | | | 100.0 |

Source: Gordon D. Markworth and P. L. Buttrick, "Why Men Enter the Profession of Forestry," Journal of Forestry, Vol. 37 (1939), 191-193.

asked the question, "Do men selected for the original purpose of the service also possess the interests of men dealing with people?" His answer to the question seems equally prophetic in light of the emphasis upon the role of recreation management in the present practice of forestry:

... if the forest service is to handle the problem of recreation within the forests, it must have men in the organization who understand such problems and genuinely enjoy dealing with them. Such interests are different from the interests of the typical forest man. Two ways of meeting the situation occur to us. First, men who possess both types of interest might be brought into the service. Second, men who are possessed of the recreational type of interest might be brought into the service to be specialists in this field. The former is a doubtful procedure because there are not many men who possess both sets of interest.

The concluding statement in the above quotation highlights a summary of Strong's thesis.

One final point, regarding the Strong study, which has relevance for this study is the point that the ranger type individual has generally the same interests as skilled tradesmen, particularly farmers. This point tends to support the J. L. Holland typology which was first presented some twenty years later as well as the work associated with the Kuder Preference Record.

W. F. McCulloch (1950) spent a substantial portion of his career attempting to develop a screening device, in terms of a forestry aptitude test. He concluded that because of the varied career opportunities in forestry it was more useful to use general aptitude testing devices rather than specific ones. He indicated a reliance on the academic aspects alone as being crucial to predicting success in college, a position frequently taken by academicians. He recognized that there

were other factors that contributed to success or failure on the job and so therefore surveyed a segment of the employed foresters in the western United States. The results of this study led to the summary statement that, "... the chief difficulties seemed to arise from a lack of personal orientation toward a professional career." McCulloch's conclusion regarding the inhibiting factors of professional success follows.

However, some of the more potent reasons are not academic in nature and are not predictable through testing. For example, tests will not reveal which students are most likely to encounter personal difficulties; but these difficulties are discernible in the conduct of their field work, and the best test is to examine that field work ... constant checking in the field, matched by aggressive action in the school, will remedy, personal and professional deficiencies; ...

Reliance in such a glossy solution seems naive at best. It ignores the basic fact that students bring to college with them their self constructs and assumes a presumptuous accomplishment on the part of the educational system. A comparison of McCulloch's listing of common deficiencies in 1950 with any forestry professors list for today, demonstrates the validity of this criticism.

1. Students do not analyze problems adequately.
2. Students are ineffectual in the use of written and spoken English.
3. Students are too demanding.
4. Students expect too much in the way of social advantages.
5. Students are not competent in work-planning; cannot organize a job.
6. Students fail to relate their specific jobs to the whole work program of the employer.
7. Students are not safety minded.

While he indicates that none of these deficiencies are malicious, he allows that they are all educable. Yet, they persist today in every measure and are the same complaints employers presently list. The literature is replete with support for this statement.

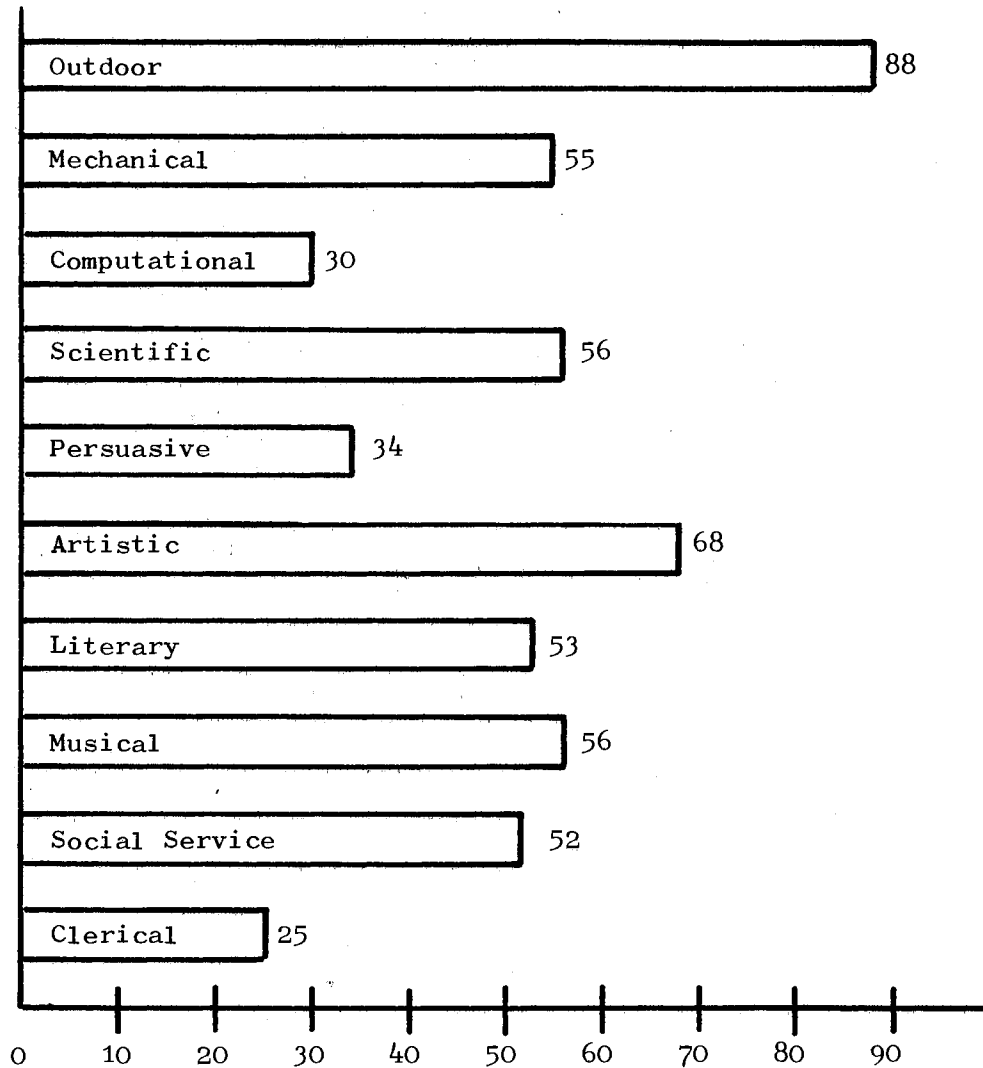
It is the thesis of this paper that McCulloch's characteristics of professional failure are a function of a vocational decision made with inadequate knowledge of the work environment which results in a discrepancy between personality type and organizational objectives.

In 1954 Bourdo (1954) reported on a study he made at Michigan Technical Institute. With a goal similar to that of the current study, he said that "... there is a need for information on the attributes which seem to characterize the men it attracts and the men who do well in the practice of it." Using the Kuder Preference Record with 103 students, he found, as expected, a high preference for interests in the out-of-doors. In fact 79 of the subjects scored in the seventy-fifth (national) percentile while only six rated below the twenty-fifth percentile. His data is presented in Figure 1.

It is interesting to note the high level response in the artistic category in the light of Holland's findings on the artistic interests,

While the respondents showed fairly strong inclinations toward the artistic and strong disinclinations towards the clerical and computational categories, Bourdo's conclusion was that "... a high outdoor interest carries with it no assurance that a person is adjusted, or can adjust, to forestry."

Brody (1957) administered the Kuder Preference Record to 259 professional foresters in the Northern Region of the Forest Service in 1950. On the ten Kuder interest scales, the Forest Service foresters registered significantly higher than the national norms on the outdoor, mechanical, scientific and literary scales and significantly lower interests on the persuasive, musical and clerical scales. The interesting point is that the maximum differences from the national norms were the outdoor,



Source: Eric A. Bourdo, "The Interests of Forestry Students," Educational and Psychological Measurement, 14 (1954), 683.

Figure 1. Profile of the Interests of Forestry Students, Based on the Kuder Preference Record. The Raw Score Means for 103 Tests are Converted to Kuder National Percentiles.

persuasive and clerical scores. The former having a mean score above 87 per cent of the male population while the latter two were at the 28 and 26 per cent levels, respectively. This tends to support the findings of Strong (1945) and others in that the negative persuasive response tends to negate interests toward the management administrative jobs. It is surprising that this study does not show the group having interests different from the national averages in social service interests or in the artistic, in view of those findings of Bourdo and Strong.

Hornaday (1959) reported the development of the Forester's interest scale as part of the Kuder Preference Record. He indicated that the work was done in cooperation with the Society of American Foresters. The objectives of such interest scales are to give young persons who are in the midst of making vocational decisions a basis for comparison of their interests with those of practitioners in the field. If successful, vocational guidance systems based upon interest inventories will tend toward increasing homogeneity in the various fields.

In an in-house study of the Forest Service, Mayeske (1963) reported a longitudinal study that was made as a follow up of Brody's (1957) work. His findings generally confirm those of Strong's (1945). There were 87 foresters who had been in G. S. grades 5 and 7 in the 1948-49 study who were still in the Forest Service. Thirty-eight of the group had left the agency. The conclusions drawn from the study were that:

(a) those who remained in the Forest Service had scores higher on the outdoor scale than those who left, and (b) those who moved into the higher grade levels had scores lower in outdoor, scientific and persuasive interests than the average for those remaining in the service.

Mayeske suggested that the outdoor-scientific interests were stable for those who advanced in the agency, but that the interest in the persuasive arts changed as the result of intervening experience.

It is interesting that such studies as the Mayeske one, isolated the problems quite clearly.

... to have too many of one or the other kind of person would tend to upset an equilibrium necessary for overall program success. Thus, if in initial selection the Forest Service were to put too much emphasis on a high Outdoor score it might well be faced with the scarcity of men who, later on, would be available and suitable for administrative positions.

As will be shown later in this paper, however, the major recruitment force is still an interest in the outdoor pursuits.

Between 1963 and 1966 Frank and Kirk (1970) administered a battery of psychological tests to 136 forestry undergraduates at the University of California. The battery included the School and College Ability Test Form 1 C, the Strong Vocational Interest Blank, the Minnesota Multiphasic Personality Inventory, and the Edwards Personal Preference Schedule. The results reported in this study follow:

1. The Strong Vocational Interest Blank represents the forestry graduate as having predominantly active, outdoor, masculine interests with greatest strength in Group IV and peaks on Farmer, Aviator and Forest Service Man.
2. The Edwards Personal Preference Schedule shows an emphasis on order and endurance, an indication of effective scholarship... . The relatively low preference for dominance suggests that this group falls less in the category of leader than of independent performer.
3. The Minnesota Multiphasic Personality Inventory describes an essentially healthy, normal, stable group of men, and this appraisal from the mean scores is supported by review of the individual profiles.

The authors also conclude that foresters are in the mainstream academically and universally report love of the outdoors as the original basis for their selection of forestry.

Recently I. I. Holland and Beazley (1971) reported an interesting study at the two schools in Illinois that have forestry programs. Using the 16 Personality Factor Test and the Motivation Analysis Test they set out to determine what sort of individuals forestry students were.

Their general interpretation of the results of their work were as follows:

... the forestry student, compared to the average male college student, is more concerned with material activities, expresses hostilities naturally, is willing to meet the world "on its own terms," and tends toward independence and autonomy, ... forestry students appear to lack an egocentric life style, have low need for career status and economic competition, to be low in anxiety, and generally are satisfied and contented.

In summary ... the typical Illinois forestry student could be described as follows:

1. He is intelligent, resourceful, well balanced with a relatively high degree of emotional stability; he is not easily aroused and tends to be somewhat submissive and accepting.
2. He is capable of independent decision making and autonomous action.
3. He is dependable and conscientious.
4. He is oriented toward material rather than abstract activities and prefers a non-egocentric life style.
5. He displays a tendency toward personal satisfaction and contentment.
6. He has a relatively low need for career status and lacks intense drive for economic competition.
7. He can be rather easily satisfied with respect to a job but highly involved in his chosen occupation.
8. He is conservative and undemanding.
9. He is only average on leadership, but high on creativity.
10. Although he can work well with others, he is reserved and nonaggressive and not inclined to initiate involvement with people generally.

The conclusion these authors drew from their study was that the above

profile is not one indicative of persons apt to be in leadership roles where people, politics, and economics are involved.

While it is easy to agree with them in their summary, it is difficult to interpret their test results so as to identify the various points listed in their profile. They indicate a reliance on interpretive assistance from professional guidance people, and, in order to accommodate to their data, the writer must too.

Summary of Studies of Foresters

The studies presented trace a 40 year history of attempts to type the professional forester. These studies have been either with student samples or with foresters in the United States Forest Service. There does not seem to be a single attempt with a profession wide sample, nor have there been any efforts to relate interest scores to personality types. There has been a universality in the reporting of the outdoor syndrome and its attending implications for the life and health of the profession, but there has been no evidence that the schools, employers or professional associations have done anything about the implications. There seems a general agreement amongst those doing research in the area that it would be useful to have a predictable typology for foresters, and there seems little if any recognition that such a typology might force the narrowing of the professional norms and result in a more isolated profession rather than the reverse. There is a common reluctance to deal with personality constructs, except in the I. I. Holland and Beazley (1971) study, and to rely upon interests alone as guides to the vocational counseling. It is believed that this fact alone has

tended to perpetuate the outdoor syndrome. A discussion of this point will be found in Chapter V.

Career Choice

There is much work reported in the area of career choice. It tends to center around groups of research workers who have followed specific aspects of a career choice theory. Osipow (1968) has summarized the work of the major contributors in the field and made evaluative remarks about each. He considers Roe's personality theory, Holland's theory of vocational behavior, the Ginzberg et al. developmental theories, the psychoanalytic theories of Bordin, Erickson, and Segal, Super's self-concept theory, theories associated with personality and career choice, and theories relating to career decisions which are socially motivated. Osipow's presentation does much to bring order out of chaos in this field. Key (1970) adds considerable insight in his suggestion that most occupational choice theories can be placed into one of the following categories: trait-factor theories, personality theories, developmental theories, and sociological theories. Key developed a useful model for visualizing the interrelationships of the various theories by enumerating the occupational influences, the concepts of choice, and the actions of choice, as all making contributions to the individual's occupational choice. As Osipow pointed out, most of the theorists have chosen to emphasize only one or two of the many factors included, when in reality the choice process probably involves many. An important point in this connection relates to the idea that every occupational choice is not the result of a blend of the same amount of each factor mixed in the same way. The probability, therefore, is that there is no optimum theory.

There are several ideas not summarized in Osipow that have value for consideration. The California Coordinating Unit for Occupational Research and Development (1967) has reviewed much of the literature around sixteen bases for occupational choice. Their list includes interests, parents, aspiration, maturation, attitudes, prestige values, achievers, motivation, self-concept, stages of choice, vocational history, individual counseling, group counseling, guidance, college and studies of job rates. All of these factors are undoubtedly contributive to career choice at one time or another, but none are mutually exclusive.

Mahone (1966) suggests that occupational choice is associated with the fear of failure. He says that persons fearful of failure:

1. tend to choose occupations that are unrealistic in terms of discrepancy between their own ability and that they judge necessary for the occupation,
2. tend to make vocational choices that are unrealistic in terms of the discrepancy between their own perceived ability and what they perceive as being suitable for the occupation,
3. tend to be inaccurate in their estimate of their own ability, and
4. tend to choose vocations that reflect interest patterns discrepant with their own.

Mahone's position is supported in cognitive dissonance theory (Festinger, 1957) explained by Osipow (1968) as "... the discord introduced into one's perceptions of the world and his role in it by the observation of events that are grossly at variance with expectations." Benoit-Smullyan (1944) pointed to this same idea in discussing status congruence. He suggested that persons find themselves in many social hierarchies and that there is a tendency for a person to strive for a harmonious position in each.

Burnstein (1963) and Burnstein et al. (1963) enlarged on the occupational role idea relating to choice. This group said that an

occupational role requires a level of excellence and the role-player who meets that level accrues a level of prestige. Subjects who are high in achievement need have strong internal desires to excel; so when an occupational role permits the demonstration of excellence, these persons are more likely to be attracted to that field. These writers build a complete rationale for role attractiveness through need achievement. An important conclusion of Burnstein's is that "... as fear of failure increases, the prestige of aspired-to occupations decreases, and the willingness to settle for less satisfying and prestigious occupations increases." These findings have important implications for any professional field that does not think that it enjoys a high prestige rating. It is perhaps this very idea that causes forestry to be so preoccupied with its prestige and public image.

The above discussion indicates the problem in identifying specific psychological personality similarities regarding occupational choice, yet there seems to be little question that there are similarities in personality characteristics amongst members of a given vocation. Roe's (1956) study leads her to the conclusion that some specialized occupations do attract persons who resemble each other in some personality characteristics. Roe's theory generally supports Maslow's (1970) need theory and results in an ingenious circular configuration which relates eight broad groups of classifications to each other and to the developmental aspects of the individual's personality (1957). The circular configuration of the occupational groups is of particular interest because it has recently been verified using Holland's theory and the Vocational Preference Inventory that has been associated with it (Cole and Hanson, 1971). The basic Roe groupings are: service occupations,

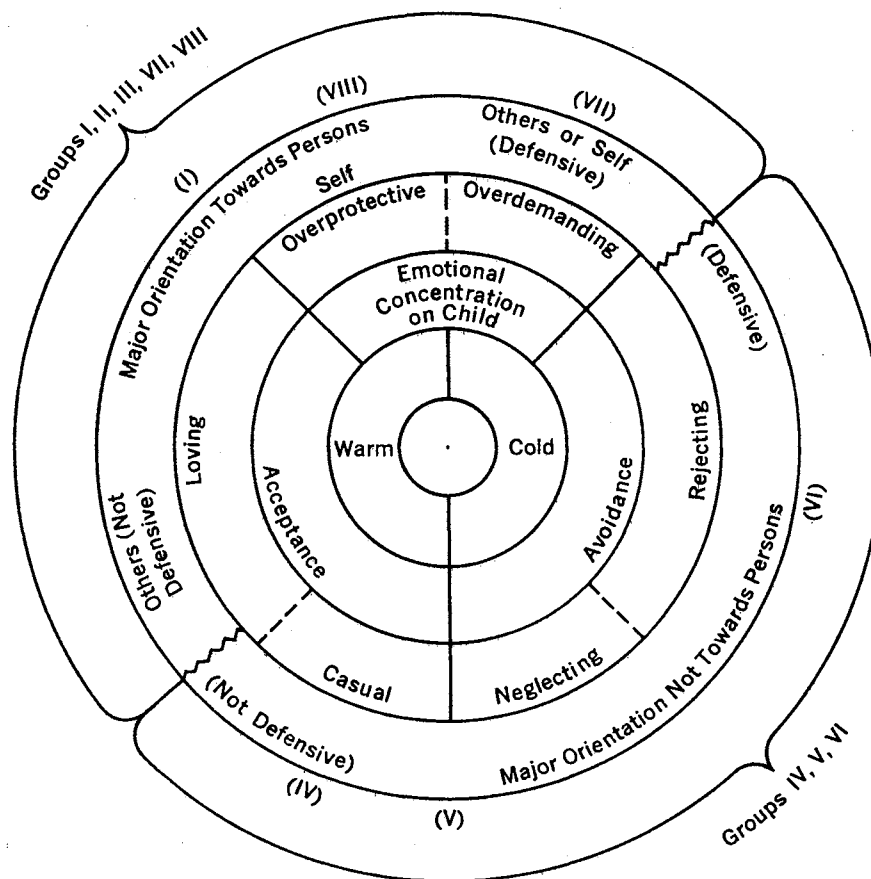
business-contract occupations, organization occupations, technological occupations, outdoor occupations, scientific occupations, general cultural occupations, and occupations associated with the arts and entertainment. The circular configuration simply places these into compatible groupings which have similar causative agents. Outdoor occupations are flanked by technological and scientific occupations taking up one-half of the circle (Figure 2), indicating that much of the contributive background to a choice in any of the three areas is similar.

It is obvious that forestry would fall into the outdoor category, and choice in these occupations is characterized by a "... major orientation not towards persons" (1957). This is perhaps a key to the forestry dilemma in that persons are attracted to the field because of its perceived lack of orientation toward people, yet the demand, in terms of the new occupational role, is for entrants who are people oriented. Furthermore, the most obvious related groups such as science and technology are also alleged to be non-person oriented groups.

Super (1963) introduced the idea of self-concept into the occupational choice picture. In discussing occupational choice as it relates to personality, Super said that:

... in expressing a vocational preference, a person puts into occupational terminology his idea of the kind of person he is; that in entering an occupation, he seeks to implement a concept of himself; that in getting established in the occupation he achieves self-actualization.

According to Maslow (1970), self-actualization represents the ultimate goal for persons. This is why there is so much attention being given to the occupational choice process. Super goes on to say that the occupation makes possible the playing of a role appropriate to the self-concept



Groups

- | | |
|----------------------|------------------------------|
| I. Service | V. Outdoor |
| II. Business Contact | VI. Science |
| III. Organizations | VII. General Cultural |
| IV. Technology | VIII. Arts and Entertainment |

Source: Samuel H. Osipow, Theories of Career Development,
 New York: Appleton-Century-Crofts, 1968, 18-19.

Figure 2. Roe's Construct of Occupational Choice

and that the self-concept is best revealed in terms of the "I am" statements of the individual's own conceptualization of himself. The implication here is that self-concept is an idiosyncratic characteristic and is not that assigned through inference by an outside other, whether that other is a man, machine or a testing instrument. It is for this reason that the Holland (1966) theory of occupational choice and its attending instruments has appeal for application in studies of this nature.

Holland's Career Typology Theory

The assumptions underlying the Holland theory are:

1. that occupational choice is an expressive act of personality,
2. that inventories of interest are really personality inventories,
3. that vocational stereotypes have reliable sociological and psychological meanings,
4. that the members of any given occupational group have similar personalities and histories of personal development,
5. that because of 4 above, persons in a specific vocational group will respond to many situations and problems in similar ways, and
6. that satisfaction in occupational choice, stability, and achievement depend upon congruence between personality and the work environment which is composed largely of other people. (Holland, 1966).

Holland contends that all occupational personalities can be grouped into six model types which are outcomes of dealing with the culture. The model type is an orientation or a cluster of life histories, coping behaviors, self-concepts, psychological needs, vocational and educational goals, preferred vocational roles, aptitudes and intelligence. The personality types and the vocational preferences defining each are given as follows (Holland, 1966):

Realistic: The model type is masculine, physically strong, unsociable, aggressive; has good motor coordination and skill; lacks verbal and interpersonal skills; prefers concrete to abstract problems; conceives of himself as being aggressive and masculine and as having conventional political and economic values. Persons who choose or prefer the following occupations resemble this type: airplane mechanic, construction inspector, electrician, filling station attendant, fish and wildlife specialist, locomotive engineer, master plumber, photoengraver, power shovel operator, power station operator, radio operator, surveyor, tree surgeon, tool designer.

Intellectual (now called investigative): The model type is task-oriented, intrceptive, asocial; prefers to think through rather than act out problems; needs to understand; enjoys ambiguous work tasks; has unconventional values and attitudes. Vocational preferences include aeronautical design engineer, anthropologist, astronomer, biologist, botanist, chemist, editor of a scientific journal, geologist, independent research scientist, meteorologist, physicist, scientific research worker, writer of scientific or technical articles, zoologist.

Social: The model type is sociable, responsible, feminine, humanistic, religious, needs attention; has verbal and interpersonal skills; avoids intellectual problem solving, physical activity, and highly ordered activities; prefers to solve problems through feelings and interpersonal manipulations of others; is orally dependent. Vocational preferences include assistant city school superintendent, clinical psychologist, director of welfare agency, foreign missionary, high school teacher, juvenile delinquency expert, marriage counselor, personal counselor, physical education teacher, playground director, psychiatric case worker, social science teacher, speech therapist, vocational counselor.

Conventional: The model type prefers structured verbal and numerical activities and subordinate roles; is conforming (extrceptive); avoids ambiguous situations and problems involving interpersonal relationships and physical skills; is effective at well-structured tasks; identifies with power; values material possessions and status. Vocational preferences include; bank examiner, bank teller, bookkeeper, budget reviewer, cost estimator, court stenographer, financial analyst, IBM equipment operator, inventory controller, payroll clerk, quality control expert, statistician, tax expert, traffic manager.

Enterprising: The model type has verbal skills for selling, dominating, leading; conceives of himself as a strong, masculine leader; avoids well-defined language or work situations requiring long periods of intellectual effort; is extrceptive;

differs from the conventional type in that he prefers ambiguous social tasks and has a greater concern with power, status, and leadership; is orally aggressive. Vocational preferences include business executive, buyer, hotel manager, industrial relations consultant, manufacturer's representative, master of ceremonies, political campaign manager, real-estate salesman, restaurant worker, speculator, sports promoter, stock and bond salesman, television producer, traveling salesman.

Artistic: The model type is asocial; avoids problems that are highly structured or require gross physical skills; resembles the intellectual type in being intrceptive and asocial; but differs from that type in that he has a need for individualistic expression, has less ego strength, is more feminine, and suffers more frequently from emotional disturbances; prefers dealing with environmental problems through self-expression in artistic media. Vocational preferences include art dealer, author, cartoonist, commercial artist, composer, concert singer, dramatic coach, free-lance writer, musical arranger, musician, playwright, poet, stage director, symphony conductor.

Holland (1964) summarized his perception of the occupational decision this way:

At the time he chooses a vocation, a person is the product of his heredity and a variety of cultural and personal forces, including peers, parents, social class, American culture, and the physical environment. Out of this experience he develops some preferred ways of coping with environmental tasks. From an ecological standpoint, these orientations or coping methods are associated with characteristic physical and social environments and with characteristic patterns of abilities. The person making a vocational choice in a sense 'searches' for those environments which are congruent with his personal orientations.

The total number of preferred occupations then, according to Holland (1958) is a function of dependency, aggressiveness, mood, degree of cultural introspection, self control, sociability, and defensiveness.

Holland (1965) and his co-workers have done considerable work in relating the six occupational categories to other theoretical constructs.

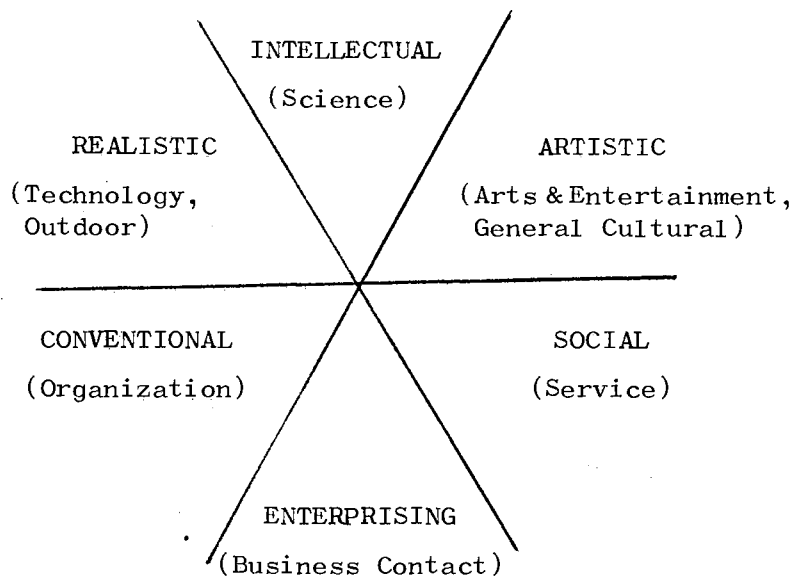
The most interesting of these is the work of Cole and Hanson (1971).

Holland et al. (1969) had earlier suggested a hexagonal spatial arrangement for the six categories as the result of factor analyzing over

22,000 responses to the Vocational Preference Inventory. The idea was that the model would aid in interpreting inter-class and intra-class relationships. The categories were arranged around the hexagon at each of the six points. Starting with the Realistic classification at the top left location the clockwise sequence was Investigative, Artistic, Social, Enterprising, and Conventional. Cole et al. (1971) used the hexagonal model then to relate to Roe's circular configuration, and they demonstrated how easily the two constructs matched. They then looked at several instruments including the Strong Vocational Interest Blank, the Kuder Preference Tests and the Vocational Preference Inventory, and found the circular configuration essentially common to all. Cole et al. (1971) extended this work to the location of individuals and occupational groups in the spacial arrangement. Forestry as an occupation was located between the Realistic and Investigative groups and such findings are pointed to as providing consistency for the theory.

The major implication of the above work is that there is apparent validity to the Holland theory as it relates to those of other workers along with its internal consistency. Certainly as the interrelationships between the various theories are found, comparisons of results of studies with different groups will be more meaningful.

The circular arrangement showing both the Holland and Roe classifications as suggested by Cole and Hanson (1971) appears in Figure 3. Both theorists point out that adjacent groups represent second order affinity. This idea has great utility for counseling but also helps to confirm the idea that if occupational role and perceived role are dichotomous, it is difficult to secure entrants that will match the role expectations.



Source: Nancy S. Cole and G. R. Hanson,
An Analysis of the Structure of
Vocational Interest, Iowa City,
Iowa: American College Testing
Program, ACT Research Report
No. 40, 1971.

Figure 3. Circular Ordering of Holland's
Categories (in Capital Letters)
and the Corresponding Ordering
of the Categories of Roe (in
Parentheses)

Campbell and Holland (1972) have recently attempted to integrate the two areas of vocational interest work represented by E. K. Strong and J. L. Holland. Most of the work reported by these authors was done through intuitive reasoning, yet because of the wealth of experience and data represented by the two, their conclusions seem to bear inclusion here. They indicated that the results of their study clearly showed that the Holland theoretical structure provided a useful model for organizing the Strong data. The implication was that the two inventories, i.e., the Strong Vocational Inventory Blank and the Vocational Preference Inventory, had considerable similarity, and they suggested that the Holland typology could be used for gross classifications while the Strong Scales were used for specific interest differentiation.

Navran and Kendall (1971) support the subjective studies of Campbell and Holland regarding the relationships between the Strong Vocational Inventory Blank and the Vocational Preference Inventory with a study of 227 freshmen-sophomore military cadets. They administered the Vocational Preference Inventory, the Strong Vocational Inventory Blank, and the Edwards Personal Preference Schedule to their sample. Using canonical correlation analysis, "which determines the linear combination of a second set" to maximize the correlation between the two, they reported considerable overlap between the Vocational Preference Inventory and the Strong Vocational Inventory Blank and suggested that there is a moderate relationship between inventoried personality and interest traits. Based upon the findings so far, continued efforts to study the similarities and differences between the major vocational inventory instruments should prove to be quite fruitful.

The Holland instrument is a listing of 160 occupational titles, 84 of which are assigned to one of the six basic categories. The subject simply reads each title and responds on a yes or no answer sheet. The response is alleged to be the person's own response to himself regarding the desirability of that vocational title if there were no limiting factors of finances, education, etc. One of the advantages of this type of approach is that subjects are not so apt to fake when taking this inventory because the element of personality measure is well concealed.

Roe (1964) pointed out that personality is not an independent variable, nor is occupation a dependent one. She said that occupational behavior is a life long process that should be recognized as one facet of the general behavioral repertoire that is basic to the dynamics of the individual. This is an important point, for it focuses on the idea that work histories need to be included in the consideration of any typology.

Holland et al. (1970) reviewed the historical development of his theory and summarized the research that has been done in support of it. Perhaps the most impressive aspect of this work is that he reports findings based upon better than 22,000 student responses from over thirty colleges and universities.

Holland et al. (1970) reported on the development and validation of the most recent presentation of the classification system. The classification includes 431 titles which encompass a large number of the most common occupations in the United States. The classification is arranged in a system using the first letter of each of Holland's six categories. If a subject responds to the Vocational Preference Inventory

with the Realistic category gaining the most responses, his basic grouping will be R. If the second highest response is to Investigative titles, and his third highest response is to Enterprising titles his total profile would be RIE. The three letter codes allegedly give rough approximations of the various occupational descriptions. In its present form, the Holland typology for forestry is given as RIS. The acronym suggests that persons should exhibit the personalities associated with the Realistic classification along with those of the Investigative and Social groups in order to have a personality congruence with the occupation of forestry. The data was taken from 105 students who gave forestry as their major field in the 22,000 student sample. A description of the model forester, using this classification might be something like this: a physically strong and masculine person who is task-oriented, mildly asocial, lacking in verbal and interpersonal skills, who can tolerate mild levels of ambiguity but who prefers concrete problems, who sees himself as having conventional political and economic values.

The comparison of this typology to that of I. I. Holland and Beazley (1971) earlier, reveals a remarkable similarity. It seems difficult to justify the Social category as being the third most frequent occurring type in view of the common perception of forestry and in view of its position in the hexagonal arrangement discussed earlier.

Abe and Holland (1965b) examined 12,432 college freshmen from thirty-one institutions. There were 90 students in forestry. In lumping forestry along with other agricultural fields the authors made the following generalizations:

The choice of agricultural fields by men is associated with low artistic interests, passivity, narrow range of outlook,

low scientific achievement and graduation from small high schools. The agriculture major feels he has a poor sense of humor, and he does not think goals such as

- a. developing a meaningful philosophy of life,
 - b. being well read,
 - c. obtaining rewards and recognition,
 - d. avoiding hard work, and
 - e. engaging in exciting and stimulating activities
- are very important life goals.

It should be pointed out that this analysis comes from the complete sequence of test measures administered in the American College Testing battery of which the Vocational Preference Inventory is a part, and there were 117 variables calculated for each of the 12,432 students. It is interesting that foresters had the lowest mean scores of every field listed in scientific achievement, dramatic arts, and awards or recognition, while they did not have the highest mean score in any of the 117 categories,

The validity of the Holland typology and classification scheme is apparent in viewing the tabular results of the Abe and Holland work. As they pointed out (1965a), such a review tends to validate the meaning attributed to the classification. Various vocational assignments appear in categories that would be expected of them, e.g., bio-chemistry in Scientific, forestry in Realistic, etc.

Viernstein (1971) has attempted to extend the Holland classification to all occupations in the Dictionary of Occupational Titles. While the attempt is only a first approximation, it is really comprehensive and serves a useful purpose for vocational counselors. It also lends support to the value of the Holland typology by being sufficiently flexible to adapt to the 22,000 job titles listed in the Dictionary of Occupational Titles.

There have been several attempts to test the Holland typology with non-student samples. Holland (1970) called for the testing of the theory with such groups as a basis for helping to determine the validity of the theory. Such a test was reported by Holland et al. (1971). They applied the classification system to work histories of 973 people selected from a national sample. The objective was to verify that the system would classify like jobs into similar categories. The results indicated that the classification orders lower level occupational histories in an efficient way well beyond the limits of chance. The results were not broad enough, however, to generalize to all groups of workers or to specific occupational groups such as foresters.

Lacey (1971) extended the work in testing Holland's classification system. He applied the Vocational Preference Inventory to 230 workers well established in each of the six vocational environments. The results revealed that all of the categories differentiated the various occupational groups with the exception of the Realistic category. It was presumed that the failure of Realistic to function as theorized was due to the fact that most work categories are in this group and the differentiating characteristics associated with the category are not nearly so well defined as they are for the other categories.

While there are not yet many studies testing the Holland theory with adult groups, the results of those few that do are not all affirmative. Hughes (1972) classified 400 men into the Holland personality groups based upon their employment situation. His results did not show a great deal of consistency at all in matching Vocational Preference Inventory scores with the employed categories. He concluded that there

was much yet to be demonstrated in applying the theory to the adult working world.

Summary of the Holland Work

As indicated by this review, there has been a great deal of research work done in connection with the Holland typology. Much of it centers around college student samples which may or may not accurately reflect a true picture of the world of work for particular occupations. Holland has recognized this limitation and encouraged research workers to explore particular work histories for validation of the concepts.

This study represents an attempt to test the typology in a rather specific case, of a relatively small professional work environment, that of the practicing professional forester. If the theory and the typology prove useful for many such specific cases, it can be used with confidence in predicting occupational environments of a broader, less specific nature.

Kuhn's Twenty Statements Test

As indicated earlier, the self-concept is apparently an important part of the vocational decision. The literature on self-concept is too voluminous to be reviewed here in all of the various ramifications. Spitzer, Couch and Stratton (1970) indicate, however, that Kuhn's Twenty Statements Test has unquestionably been used more than any other instrument in an attempt to tap the self-concept idea. Their work summarizes in a single monograph the majority of the work to date and presents an inventory of 81 studies made between 1954 and 1969 using the Twenty Statements Test.

From Kuhn's view self-concept is approached from a socio-logical rather than a psychological perspective. The Twenty Statements Test attempts to identify how respondents locate themselves within the global social system. It is hinged in the theory that persons tend to hide their self-concept behind innocuous and conventional fronts and that statements of role preference, role avoidance and role expectations reveal their self precepts (Kuhn and McPartland, 1954). It is an attempt to elicit a level of introspection because it requires the respondent to focus his primary attention upon himself. It is evident that such is the case judging from side comments made by respondents in this study.

In form the Twenty Statements Test is simply a list of twenty blanks headed by an initial statement requesting the party to complete twenty statements in response to the question "Who am I?" He is asked to respond as if he were asking the question of himself and responding to himself. The responses are symbolic to be sure but are reflections of the guarded "self."

It is interesting to point out the linkage between J. L. Holland's Vocational Preference Inventory and the Twenty Statements Test since they have developed from entirely different schools of thought yet have hinged on the concept of symbolic interaction. The arguments supporting the use of the Twenty Statements Test by Spitzer, Couch, Stratton et al. (1970) are remarkably similar to those given in support for the Holland theory. The linkage of the two instruments is here presented for the first time in hopes of gaining increased insight into the nature of the occupational choice of forestry.

The Twenty Statements Test is scored by subjectively evaluating the responses in terms of their consensualness. Consensual statements are those which make unambiguous references to membership in social groups and categories. Such statements place respondents in easily definable social systems and a preponderance of such responses locates the responder in respect to them as being socially ordered (Tucker, 1966).

In contrast, the non-consensual statements are those which would require considerable refining by the respondent if they were to be understood. Persons with a majority of such responses are alleged to be not so socially anchored and they tend to take their cues from a more internalized "self."

While there are several methods of scoring the Twenty Statements Test, presented and discussed by Spitzer, Couch, and Stratton (1970), the consensual versus non-consensual classification is the only one to be employed by this study because it gets at the basic objective of attempting to describe the occupational culture of the professional forester as represented by the two sample groups selected for the study.

CHAPTER III

RESEARCH METHODOLOGY

Selecting the Sample

There are more than 17,000 members of the Society of American Foresters. Most of the membership is made up of practicing foresters or of those who have practiced. In order to service the objective of examining differences in Vocational Preference Inventory and Twenty Statements Test scores between the occupational entrant and the more experienced practitioner two groups of foresters were selected. Group one was defined as the entrant who had been on the job for less than three years. Target dates for this group were set as persons gaining employment during the years 1969-1971.

The second group was selected as having ten years of experience. It was hoped to get a substantial number of persons in the job description district forester-ranger, as these jobs represent the first real point at which the technological sociological interaction comes to bear on the management of the forest enterprise. Target years for this group were set to be commensurate with those of group one as being foresters who gained initial employment during the years 1959-1961.

It was reasoned that most foresters would join the professional society in close proximity to their first employment date; so the same years were used for each group as a basis for pulling the appropriate

names from the Society's mailing list. Because of the costs associated with acquiring the Society's mailing list, efforts were made to restrict the number of names purchased. It was because of the cost factor that more years were not selected in pulling names off the roster.

The date of initial membership is included in the mailing list code; so it was a simple matter for the Society staff to supply mailing labels for members who had joined during the target dates,

The occupational entrant group had 2949 foresters listed and the experienced group had 1409 names. Each group was delivered, printed on self adhesive mailing labels in alphabetical sequence. The two lists were assigned numbers sequentially by alphabetical order.

Four hundred names were selected from each list at random by generating numbers on a random integer counter. The resulting 800 names were used as the basis for the initial mailing of materials.

A cover letter explaining the general objectives of the study, the Twenty Statements Test, the Vocational Preference Inventory, and a general information sheet (Appendix A) were mailed to each of the selected foresters, along with a self-addressed and prepaid return envelope. The mailing was made September 1, 1972. Each package of materials was given a color coded number in order to keep up with respondents but no effort was made to maintain the identity of any respondent. On October 15, 1972, a postal card reminder (Appendix A) was mailed to those not yet responding. By December 1, 1972, 433 responses had been returned, and no more were received after that date.

Data Processing

Of the 433 returned ballots there were 424 which were usable, i.e., that had been completed as directed. The shrinkage was due mostly to the failure of the respondent to complete one or the other of the basic inventories.

Each respondent's Twenty Statements Test was evaluated for the consensual and non-consensual statements. While this was somewhat of a subjective evaluation a record was kept of particular response sets so that uniformity could be obtained throughout. The per cent of the total number of statements made that were considered consensual were calculated for each individual.

Codes were assigned to each item on the information sheet and all data was key punched. After all the data had been verified, the sample was searched for those respondents in each group that met the employment criteria as set forth earlier.

The occupational entrant group had 81 responses that fell within the target dates while the experienced group had 119 such responses. This represents a substantial loss of the data and as indicated earlier was not anticipated.

The sample in each group was sorted into the general employment categories of state, federal, private, and all other. Two way frequency tables of employment by each of the twenty classifications, on the information sheet were generated for each group. The topical categories were: present position, state degree was granted in, highest degree received, marital status, marital status while in college, religious preference, religious activity, political preference, size of home community, age, education of father, mother's education, father's

occupation, the number of times respondent changed majors in college, veteran status, terminal position aspired to, satisfaction with forestry, reason for selection of forestry, forestry's greatest problem and favorite leisure activity. The chi-square test for differences was run for each of the categories that yielded information of value. The statistical hypothesis established for these data was that there would be no group differences demonstrated at the 95 per cent probability level for all of the classifications.

The Vocational Preference Inventory scores were calculated for all responses using the Holland format. The regular answer sheet for the Vocational Preference Inventory was not used because it was deemed unsatisfactory for self-administration. The response blanks were aligned with each title on the Vocational Preference Inventory form itself. A computer program was developed to score the adaptation according to the standard Holland procedure.

Using the SAS system program file developed at North Carolina State University, a multivariate statistical analysis program was utilized for the generation of Vocational Preference Inventory and Twenty Statements Test means and for their evaluation.

All of the data processing herein reported was accomplished for the selected group of responses that satisfied the target date criteria and was repeated for all of the usable data. Because of the objectives set forth for this study dealing with the differences in the occupational entry level group and the ten year experienced group these data are the only ones reported in the following chapter.

CHAPTER IV

RESULTS AND DISCUSSION OF THE FINDINGS

Description of the Sample

As indicated in Chapter III, the sample was selected from two groups of foresters each with a different work experience. The thought was that the occupational entrant would display a different set of responses to the various instruments than would his more experienced counterpart. It should be remembered that the research hypothesis was stated in the null form. The original sample was established with the hope of a fifty per cent return and an allowance for a small shrinkage due to inadequately completed forms, errors in dates of employment, etc.

There were 433 responses returned and 424 were deemed usable. Of the usable returns, there were 200 that fit into the initial target employment dates of 1969-1971 and 1959-1961. Table II displays the breakdown of the sample by group.

It should be remembered that not all practicing foresters are members of their professional society and there is no practical way to estimate the number that are. It is generally believed that the membership ratio is quite high. The 200 responses selected as meeting the employment criterion represent 4.6 per cent of all the Society members who gained their first employment during the target years.

TABLE II
RESULTS OF THE MAILING

| <u>Item</u> | <u>Entrant</u> | <u>Experienced</u> | <u>Total</u> |
|-------------------------|----------------|--------------------|--------------|
| Names received from SAF | 2949 | 1409 | 4358 |
| Mailings | 400 | 400 | 800 |
| Total Returns | 227 | 206 | 433 |
| Usable Returns | 222 | 202 | 424 |
| Target Date Returns | 81 | 119 | 200 |

Age, Education, and Employment

Table III gives the important data for this section. There was slightly over a ten year spread in the average ages of the sample groups as would be expected. The close alignment of the age difference between the groups and years starting employment between the groups lends support to the value of the sampling method.

All of the respondents had obtained at least a bachelors degree with 13.6 per cent of the entrants and 30.2 per cent of the experienced group having advanced degrees. This is a significant shift in educational attainment when compared to Strong's (1945) study. Twenty of the entrant group were deleted from the selected sample because their returns indicated they were graduate students working toward advanced degrees and had not yet gained employment. The chi-square test for differences applied to the college degree data indicated that there were significant

TABLE III
AGE, EDUCATION, AND EMPLOYMENT

| <u>Item</u> | <u>Entrant</u> | <u>Experienced</u> |
|---|----------------|--------------------|
| Average Age | 26.1 years | 36.8 years |
| Range in Age | 21-34 years | 30-44 years |
| Highest Degree | | |
| Bachelors | 70 | 81 |
| Masters | 11 | 29 |
| Doctors | -- | 7 |
| States degrees earned from | 30 | 25 |
| Employment Classification | | |
| State | 17 | 18 |
| Federal | 21 | 54 |
| Private Industry | 36 | 31 |
| Miscellaneous | 7 | 16 |
| Number of different job classifications | 35 | 37 |
| Most frequent job classification reported | | |
| Forester | 28 | 23 |
| Asst. Forester-Procurement Forester | 8 | 1 |
| District Forester-Ranger | 2 | 19 |
| Staff Forester | 1 | 9 |
| Forest Manager-Supervisor | 3 | 13 |

differences at the .05 level in the 2 X 3 frequency table listing groups by frequency of the highest degree earned (Appendix B, Table XI). The indication is that the educational pattern between the two groups is somewhat different, and this would be expected since advanced educational attainment is generally a function of time. The entrant group simply had not had enough time to attain comparable educational heights.

The Society of American Foresters is the official agency recognized as having the accrediting responsibility for professional forestry education. There are 38 states in the United States that have accredited or affiliated undergraduate programs located in them. Five states have more than one school. The data for this study indicates that the sample was sufficiently representative of those schools with 30 states being represented in the entrant group and 25 states being represented in the experienced group. The difference here may not appear so great since at least two new schools were started during the ten year period in question. It seems obvious to the author that the objective of obtaining a broad based national sample was achieved through the random sampling procedure used.

Respondents were asked to indicate their type of employment according to a standard breakdown for job classifications in forestry. Because the sample of consultants, educators and miscellaneous were so small, they were pooled into a single classification.

In testing the associated 2 X 4 contingency table for differences beyond those of chance, the chi-square statistic exceeded the tabular value at the .05 and the .01 levels (Appendix B, Table XII). This leads to the rejection of the Null Hypothesis (H_0) and to the conclusion that

the differences in frequency by classification are due to some causative agent.

Since 1966 there has been a reduction in new hiring of professional foresters by the United States Forest Service. Walker, Theoe, and Hopkins (1972) reported that the reduction was on the order of 383 positions between the years 1969-1971. This represents 7.5 per cent of all of the jobs in the agency and would help to account for the low number of federal workers in the entrant sample.

In further support of these findings, several of the job descriptions pooled into the miscellaneous category are of the nature that causes experience to be the qualifying criteria. College teachers and consultants are both work environments that have traditionally taken people from other categories only after having had some experience. Because of this, the entrant group would not be expected to yield as high frequencies in this category as would the experienced group.

Foresters have many job titles. The item requesting this information was a non-directive one and there was a wide variety of responses. It should be noted that there were 35 and 37 different titles listed in the two groups. It is interesting that these data do tend to show that the ten year period was right in picking up a substantial number of persons in the management-administrative job classifications. Just over 51 per cent of the older sample listed titles that could be classified as being in this group and requiring considerable skills in people oriented tasks. Only about 12 per cent of the entering group displayed job titles in the same categories with the vast majority being in the technical classifications with a minimum of direct people orientation.

The value of this result lies in the fact that if there are differences in the attitudes as measured by the Vocational Preference Inventory and the Twenty Statements Test as regards the social orientation, they should be apparent between the groups. As far as job classifications go, the sample seemed sufficiently stratified between major work orientations to be reflective of such differences if they existed.

Marital Status, Religious,
and Political Preference

The forester as represented by the sample could best be characterized as married, protestant, and somewhat right of the middle in the political spectrum. The items eliciting these responses were directive and required the respondent to use either a yes or no response or required a check mark on a Richert type scale (Appendix A). Table IV summarizes the data reported in this section.

The chi-square tests (Appendix B, Table XIII) for differences in the group by marriage status indicated significant differences at both the .05 and .01 level. Since marital status is also a function of age to some degree, the ten year age difference in the two groups can probably account for the differences indicated. There is no real significance attached to these differences regarding the occupational culture since even the lowest frequency of married exceeded the 80 per cent level.

It is quite interesting to find the high percentage of the older group married while in college. Ten years ago the young marriage did not seem so popular on the college campus as it does today, yet in this sample there were more married in school in the older group than in the

TABLE IV
 MARITAL STATUS, RELIGIOUS INFORMATION,
 AND POLITICAL PREFERENCE

| <u>Item</u> | <u>Entrant</u> | <u>Experienced</u> |
|---------------------------|-----------------------|------------------------|
| | % of Sample n - 81 | % of Sample n - 119 |
| Married | 80.2 | 95.8 |
| Married while in college | 54.3 | 61.3 |
| Religious Preference | | |
| Protestant | 66.7 | 78.2 |
| Roman Catholic | 11.1 | 14.3 |
| Jewish | 1.2 | 0.8 |
| Other | 16.0 | 5.0 |
| Are you active in church? | | |
| Yes | 32.1 | 38.7 |
| No | 42.0 | 27.7 |
| No response | 25.9 | 33.6 |
| Political Preference | | |
| Far left | 1.2 | -- |
| Liberal | 17.3 | 15.1 |
| Middle-of-the-Road | 40.7 | 28.6 |
| Conservative | 38.3 | 54.6 |
| Far right | -- | -- |

the younger one. The chi-square test did not indicate that the differences were due to anything but random chance as the H_0 was not rejected (Appendix B, Table XIV). Since the older group had almost 17 per cent more of its members with advanced degrees, the total time for college attendance was increased two to three years, perhaps more. This fact would account for the failure of the older group to respond as anticipated. The question should have, but did not, restrict responses to the undergraduate years only.

The evidence is strong that foresters represented by this sample are members of the protestant religious denominations. Nearly 67 per cent of the entrants and 78 per cent of the experienced group recorded their preference accordingly. The chi-square test (Appendix B, Table XV) tended to reject the H_0 at the .05 level only. Examination of the data leads to the conclusion that the major difference between the groups is in the "other" category. Most of the responses here were marked as being members of the Church of Jesus Christ of Latter Day Saints or as agnostics. The raw data was examined to see if these differences might show up as regional responses, but no such evidence was found.

The religious activity question was poorly incorporated into the questionnaire. The non-response in this category was higher than in any other cell of the study. This leads to the belief that the respondents did not see the cell or they would not respond, due in some connection, to the idea that it was nobody's business. It is the position of this writer that the former was the cause for the high non-response because the respondents in general cooperated so fully with the study. A response to this question did not represent the invasion

of privacy that responses to the Twenty Statements Test did. It must be concluded that the question was poorly placed in the tally sheet.

In spite of the non-response problem associated with the religious activity item, there seems to be evidence that the religious orientation of foresters in this study is not strong. About one-third of the entering group and slightly more than one-third of the experienced group indicated religious activity. The groups responded with such similarity that the chi-square test did not reject the H_0 at the .05 level (Appendix B, Table XVI).

The results of this study indicate that the foresters who responded to this effort consider themselves slightly right of the middle-of-the-road regarding the political spectrum. This item was directive and responses were preset. It was assumed that there might be a high non-response on this item but this was not the case. The chi-square test (Appendix B, Table XVII) called for the failure to reject the H_0 at the .05 level leading to the conclusion that there are no differences in the responses which can be attributed to more than random chance.

If one were to speculate that the younger group would tend towards a more liberal political stance than the older group, he might see a trend in the percentage data (Table IV), that could justify the position. It seems more significant, however, that the younger group was non-liberal considering the general perceptions of new college graduates held by this author. Certainly it can be said that foresters, as represented in this study, tend to cluster in the middle-of-the-road and to the right. It seems to matter little if they be occupational entrants or experienced practitioners.

The Family Orientation of Foresters

The data collected concerning the items of importance in this section were enlightening and useful in spite of the fact that group differences were not evidenced by any of the chi-square tests applied to the various contingency tables. Table V displays the frequency data expressed as percentages of each sample and the contingency tables with their associated statistics are in Appendix B, Tables XVIII through XXI.

Over 40 per cent of both groups indicated having been reared either on a farm or in a community no larger than 5,000 population. There appears little shifting between the groups regarding this matter except that the younger group has a slightly larger percentage from the big cities while the older group has that same difference in the 5,000 population category.

Forestry, as represented by this sample, is an occupational choice made largely by persons from the smaller, more rural communities and has not yet been invaded by a heavy influx of urban oriented interests. The fact that there is no sign of a major shift in the ten year time span represented by this study is a little surprising in view of the rapid urban shifts in the population in general.

Recently, Walker, Theoe and Hopkins (1972) reported the results of a survey taken by the Society of American Foresters among federal employers and they made the following statement:

They (employers) described today's forestry student as most frequently from an urban situation, almost always on altruistically motivated youth, and generally concerned. He searches for broader horizons than did his immediate predecessor, who was more likely to be 'timber-only' or 'dollar-only' oriented.

The results of this study simply do not bear out the above statement

TABLE V
COMMUNITY SIZE, PARENTAL EDUCATION, AND OCCUPATION

| <u>Item</u> | <u>Entrant</u> | <u>Experienced</u> |
|----------------------------|-----------------------|------------------------|
| | % of Sample n - 81 | % of Sample n - 119 |
| Community Size | | |
| Farm | 19.8 | 20.2 |
| Less than 5,000 | 22.2 | 27.7 |
| 5,001 - 10,000 | 13.6 | 15.1 |
| 10,001 - 20,000 | 13.6 | 10.1 |
| 20,001 - 50,000 | 6.2 | 8.4 |
| 50,001 - 100,000 | 4.9 | 4.2 |
| Over 100,000 | 18.5 | 14.3 |
| Father's Education | | |
| Grade School or less | 18.5 | 26.9 |
| Some High School | 13.6 | 21.8 |
| High School Graduate | 30.9 | 22.7 |
| Some College | 17.3 | 10.9 |
| College Graduate | 19.8 | 17.6 |
| Mother's Education | | |
| Grade School or less | 8.6 | 14.3 |
| Some High School | 12.3 | 21.0 |
| High School Graduate | 44.4 | 31.9 |
| Some College | 17.3 | 14.3 |
| College Graduate | 17.3 | 18.5 |
| Father's Occupation | | |
| Higher than Forestry | 4.9 | 5.0 |
| Lower than Forestry | 63.0 | 66.4 |
| Same as Forestry | 30.9 | 27.7 |

regarding urban orientation unless the smaller than 10,000 community is considered as an "urban situation." The data for the 424 responses shows no difference in this trend and while it is not reported herein it is believed important to mention as supporting the validity of the selected sample.

The apparent rural orientation may be responsible for the slightly conservative political response found in this sample and reported earlier. It may also have a great deal to do with the fact that there were so few differences found between the occupational entrant and his more experienced counterpart. The fact that over 55 per cent of both groups were reared in communities of under 10,000 may indicate that there should be few differences found between the groups regarding such matters as political preference, religious preference, parental education, etc. Such findings may be helpful in identifying the range of socio-cultural backgrounds from which foresters are being drawn. They may also be helpful in locating the normative boundaries for the professional sub-culture.

Parental educational level seems not to add a great deal of insight into group differences. In fact it tends to make the groups look more alike than different. This is supportive of the ideas suggested earlier regarding the rural orientation of the sample. The apparent similarity in the socio-economic-cultural background of the persons participating in the study was such that there were no differences measured in the parental educational background other than those due to chance alone (Appendix B, Tables XIX and XX).

The fathers' occupational data fit right into the same mold. The category used a non-directive response and scores were allocated by

judging whether the father's occupation was higher or lower than forestry on an occupational prestige scale. The historical professions such as medicine and law were identified as being higher in prestige while engineering, geology and the other so called professions were listed as being the same as forestry. The general blue collar and labor job descriptions were classified as lower than forestry.

Examination of the data in Table V indicates that the choice of forestry, as an occupation, represented an upward trend on the prestige scale for nearly two-thirds of the total respondents. This appears to be another response to the rural orientation of the sample. It is an interesting point in that it implies that in so far as the cultural perspectives of the respondents are concerned, forestry must project to their culture a satisfactory image. If it did not, the individuals would not have made it an occupational choice. As will be seen later, a substantial number (48 per cent) of the respondents listed forestry's public relations and/or its poor public image as the profession's most significant problem. It seems an important point to this writer and will be commented upon further.

Stability of the Occupational Choice

It is generally believed that most college students change majors three times while exploring for an occupational choice. The study questionnaire asked the respondents to state the number of times they changed college majors along with other questions thought to be useful in determining the stability of the occupational choice. Table VI gives the results for those questions and the chi-square contingency tables associated with them are in Appendix B, Tables XXII through XXIV.

TABLE VI
STABILITY OF THE OCCUPATIONAL CHOICE

| <u>Item</u> | <u>Entrant</u> | <u>Experienced</u> |
|--|-----------------------|------------------------|
| | % of Sample n - 81 | % of Sample n - 119 |
| Number of times major changed? | | |
| 0 | 59.3 | 68.1 |
| 1 | 34.6 | 23.5 |
| Over 2 | 6.1 | 8.3 |
| Would you choose forestry again? | | |
| Yes | 80.2 | 68.1 |
| No | 12.3 | 17.6 |
| Unsure | 7.4 | 11.8 |
| What terminal position do you aspire to? | | |
| Higher than present one | 82.7 | 68.1 |
| Lower than present one | 1.2 | 1.7 |
| Same as present one | 4.9 | 12.6 |
| Unsure of where I want to go | 7.4 | 12.6 |

The number of major changes is indicative of a fairly stable initial occupational choice. Nearly 60 per cent of the younger group and 68 per cent of the experienced group indicated not having changed majors at all. The chi-square value was considerably lower than the associated tabular value indicating that there was little difference in the choice patterns between the groups. With over 90 per cent of both groups reporting no more than one major change, it can be presumed that persons tending toward forestry have fairly well fixed perceptions of the occupational culture and of their ability to fit into it. In view of the practitioners' concern for the poor public relations, it is useful to speculate as to where these perceptions come from. The question that could not be asked and needs answering deals with those who initially selected forestry and transferred to other fields. The answer to this would go a long way toward helping to define the boundaries of the occupational culture.

The level of satisfaction with the occupational choice expressed as a response to the question, "Would you choose forestry again?" is further indication of a stable choice. The data would lead one to believe that the level of satisfaction wanes somewhat with experience since the "no" response and the "unsure" response seem to increase a little in the older group. The statistical treatment selected did not indicate, however, that the differences between groups were anything more than random variation (Appendix B, Table XXIII). These data, therefore, support those of "major change" in that foresters, as represented in this sample, tend to be satisfied with their initial selection of forestry and remain so throughout the first ten years of their working life.

In responding to the most desired terminal position the vast majority of both groups held aspirations for advancement or for improved status. This was an anticipated response but may be of some surprise to the profession's most severe critics. Again there was little difference between the group responses, and the chi-square test suggested a failure to reject the H_0 .

One item that showed significant differences between the groups was the matter of veterans' status. Almost 69 per cent of the experienced group had had some military service while only 35.8 per cent of those in the entrance group had been in the service. The military status item was one of the factors that led to the shrinkage of the original sample since the selected sample was based upon dates of the first forestry employment. Active military responses were eliminated from the entering group.

Reasons for Choosing Forestry

The foresters who responded to this study are little different from those who participated in earlier studies regarding their reasons for choosing forestry as a career. There were 29 separate categories initially allocated for coding the responses to the question. After considerable thought and study these codes were pooled into the 11 categories which are enumerated in Table VII. A chi-square test for group differences was run on the resulting contingency table, and the results again indicated that the H_0 should not be rejected at the .05 and .01 levels (Appendix B, Table XXV). The implication is that the differences that do exist are apparently due to random variation rather

TABLE VII
THE REASONS FOR CHOOSING FORESTRY

| <u>Item</u> | <u>Entrant</u> | <u>Experienced</u> |
|---|-----------------------|------------------------|
| | % of Sample n - 81 | % of Sample n - 119 |
| Reasons for Choosing Forestry | | |
| General outdoor interests | 40.7 | 46.2 |
| Contact with foresters | 7.4 | 6.7 |
| Altruistic interests | 13.6 | 8.4 |
| Some woods experience while growing up | 6.2 | 10.1 |
| Liked the general kind of work | 18.5 | 8.4 |
| H. S. Counseling, Boy Scouts, etc. | 2.5 | 3.4 |
| Good environment to live and raise family in | 2.5 | 0.8 |
| Science orientation | 4.9 | 3.4 |
| Don't know | -- | 7.6 |
| Better than anything else I could think of | 3.7 | 1.7 |

than to some real differences in reasons between the occupational entrant and the forester with ten years' experience.

As examination of Table VII shows, the love of the outdoors is by far the most dominant group of responses. It should be pointed out that not a single respondent in the selected sample mentioned that his selection was in response to the needs of people or to a people orientation. In fact, of the total 424 responses, only one expressed such a response.

The low number of responses that indicated an altruistic bent was of considerable surprise. With the present ecological press in our society it was anticipated that the entering group would demonstrate a rather high score in those responses such as the improving of the quality of the environment and the promoting of conservation. This was not the case. The result is even more surprising in light of the recent report by employers of foresters at the federal level as reported by Walker, Theoe, and Hopkins (1972) and quoted earlier. The high calling type motivation for the occupational choice simply was not demonstrated by the results of this study as the most important reason for selecting forestry.

In spite of the fact that there were no significant differences indicated in these data, by the statistical procedure employed, there may be some useful trends indicated. The entrant group had a higher expression of knowledge of the work environment (18.5 per cent) than the older group (8.4 per cent). They also had a little higher altruistic response. While these may be signaling a shift in the new occupational entrant, the evidence is not strong enough to carry these speculations too far.

The outdoor responses continue to dominate this set of data as it has all previous studies, and it is difficult to make much of a case out of any of the lesser responses. It should be pointed out in connection with the data in the next section regarding forestry's problem, that the occupational decision for forestry is thought to be related to a fantasy oriented image of the kind of work associated with it. The respondents apparently recognize this image problem in others as the general society views forestry as a profession, yet they do not articulate that their occupational choice decisions were made from the same information being used by the rest of society. This may be a clue to the frustrations being expressed regarding forestry's role in society as described earlier.

Forestry's Greatest Problem

The questionnaire asked each respondent to identify the most serious problem faced by professional forestry. It was a non-directive question and it elicited a wide range of responses. There were a total of 41 codes allocated to the responses initially and these were pooled into 14 categories after the writer had a chance to look at the frequency data. An attempt was made to retain categories that had distinctly different points of view. Table VIII gives that data as it was analyzed, expressed again as a percentage of the total responses in each group.

The chi-square test for differences in the 2×13 contingency table indicated that there were differences evidenced between the groups. The H_0 was rejected at the .05 level only (Appendix B, Table XXVI) which

TABLE VIII
FORESTRY'S MAJOR PROBLEM

| <u>Item</u> | <u>Entrant</u> | <u>Experienced</u> |
|--|-----------------------|------------------------|
| | % of Sample n - 81 | % of Sample n - 119 |
| Major Forestry Problem | | |
| Public relations | 44.4 | 27.7 |
| Low pay - no jobs | 7.4 | 4.2 |
| Non professional performance of peers | 9.9 | 26.1 |
| Forestry's poor image | 11.1 | 15.1 |
| Over concern for image | 1.2 | 3.4 |
| Inadequate technology | -- | 1.7 |
| Problems of land use | 4.9 | 6.7 |
| Political problems | 3.7 | -- |
| Infringements by environmentalists | 8.6 | 5.0 |
| Society of American Foresters | -- | 1.7 |
| Not people oriented | 2.5 | 3.4 |
| Educational problems | 2.5 | 0.8 |
| Miscellaneous | -- | 0.8 |

causes one to conclude that there were differences between the groups in this response.

There are two cells where the differences are readily apparent. The first is in the area of public relations. A substantial number (44.4 per cent) of the entering group indicated that forestry had a serious public relations problem. The uninformed public, poor public opinion, and lack of public education were frequent responses in this group. The older group, however, did not think this was as serious a problem, yet it was the highest single response given (27.7 per cent).

It seems safe to state using this data as a basis, that a large number of foresters feel that forestry suffers in the area of communicating its ideas to the public. The younger foresters apparently have a stronger inclination on this than do the more experienced ones. There is no clear basis for understanding the differences within the framework of the data other than to say that they seem to be due to more than random chance. One contributing factor could be that schools have emphasized the image problem in recent years, while ten years ago they did not. Perhaps too, the older foresters tend to have concerns that are better defined because of their greater experience base.

The other cell that showed substantial differences in frequency of response between the groups was that dealing with non-professional performance of practicing foresters. The elder group cited this category with an alarming frequency and gave it a close second place finish to the public relations problem with a 26.1 per cent response. Comments such as: lack of professionalism, non-professional work performance, lack of professional pride, complacency, authoritarian management

attitudes, and lack of credibility between what we say is done and what is done, are representative of the responses in this category,

It is believed that the results in this segment of the study are such that forestry as a whole and forestry education, in particular, should give considerable thought to them. There is a rather strong feeling on the part of the experienced practitioner, participating in this study, that professional performance is not what it ought to be. It is impossible to put words into the respondents' mouths, and that is not the objective of this study, but it seems that this response is saying something to foresters that cannot and should not be ignored.

The other differences in responses between groups by the various categories are interesting but not too revealing in terms of significant differences. The listing serves mainly as a summary of the kinds of problems foresters see the profession needing to face up to.

One point of interest has already been alluded to in the previous section. It needs more clarification here. A large portion of the foresters responding to this study suggest that forestry in general needs to communicate more of its technology, its responsibilities, and its capacity to deal with problems to the general public. When one adds the poor forestry image response to those of need for improved public relations the size of the group expressing this concern becomes more impressive. One gets the feeling that there is a strong attitude on the part of many foresters that they are simply misunderstood by the public. There is no evidence, however, in the data that would indicate that they recognized this problem as they selected forestry for their occupational choice. The data suggests, as earlier indicated, that the choice matter is rather stable and free from indecision and gives every evidence of

being a decision that is made with adequate information and understanding of the field.

One might discharge this by raising the rural nature of the respondent and indicating that it is the urban public that needs education on what forestry is all about. This idea was pursued by examining the raw data to find what the urban respondents gave as an answer to the question of forestry's problem. There were 32 respondents who listed their home community as being over 100,000. Only four of those gave responses to the question in categories other than those included in the public relations and poor image items. It does not seem, from this, that the rural nature of the sample can account for the apparent isolation of information about forestry.

When this idea is coupled with all the rest of the data reported on to this point, it appears that the vocational choice of forestry is not one that is made with great insight into the occupational culture. If the outdoorism is related to an avocational type interest rather than to an altruistic calling or to an occupational commitment, then the frustration which was alluded to earlier may well be a response to this apparent dichotomy in the choice process. As the professional roles change from one of applying technology to trees to one of developing programs to satisfy public interest, the narrowness in the bounds of the occupational culture become apparent. In spite of the recent statement by Walker, Theoe, and Hopkins (1972) that, "... all foresters are no longer poured from the same mold," it seems the evidence presented in this study tends to suggest that there is a real similarity between those who are involved in forestry as a profession. This is the same point raised by E. K. Strong (1945) some 28 years ago. In order to

clarify this point further, it is necessary to look at the data pertaining to personality types as discussed in the following two sections of this chapter.

The Twenty Statements Test Response

The Kuhn's Twenty Statements Test is a highly non-directive instrument which is alleged to cause the responder to reflect about himself, to himself. Persons whose responses are predominately consensual find their self-concept anchors in social structures and in socializing situations. One might liken these persons to those described by Riesman (1961) as "other directed." They should demonstrate personality constructs that would cause them to gravitate toward social interactive situations, working with and through people. Examples of typical consensual responses are: "I am a man," "I am a father," "I am a forester," and "I am a hunter." In each case the response fixes a social grouping without need for further clarification and indicates a reliance upon well defined social structures as anchorage points.

The non-consensual responder, in contrast, takes more of his cues from his own internalized self-system. He does not so often tie himself to the well defined social structures. His typical responses are: "I am a great forester," "I am a good husband," "I am too fat," and "I am a terrible hunter." In each of these response sets, further clarification is needed in order to isolate the meaning of the statement. Riesman's (1961) "inner directed" man seems to describe this group rather well. These persons tend toward social introversion and would not be expected to seek out work environments which are perceived to have high levels of social interaction.

The overall sample mean, based upon the 200 responses, was 36 per cent consensual (Table IX). This locates the sample, and those foresters represented by it, well into the non-consensual category. Generally, it can be said that the foresters gave two non-consensual responses for every three responses given.

Interpretation of these data would be enhanced had information regarding national norms been located. Since they were not, some speculation must enter the interpretation because there is no way to scale the responses in terms of the general public. The data tends to verify the thought that foresters represented by this sample would be non-consensual in nature. The pattern of differences between the mean scores displayed in Table IX were predictable in some measure. The author's initial perceptions of the Twenty Statements Test responses were that foresters having more work experience would demonstrate a correspondingly greater level of socialization and would be more consensual. It was thought that foresters opting for work environments such as consulting and school teaching (the "other" classification) would have higher social scores than those in the federal and state agencies. The industrial foresters were thought to be somewhat intermediate to the two other groups.

The differences are apparent as predicted, although the statistical analysis did not show them to be great enough to be considered statistically significant (Appendix C, Table XXVII). There was a great deal of variation in the individual response sets, as seen in the relatively high standard deviation of 23.78 per cent consensual responses. Further evidence for this statement is found in the rather low regression coefficient indicating that only 3.7 per cent of the total variation was

TABLE IX
RESULTS OF THE TWENTY STATEMENTS TEST

| <u>Item</u> | <u>Entrant</u> | <u>Experienced</u> |
|------------------------------------|------------------------|-------------------------|
| | % Consensual n - 81 | % Consensual n - 119 |
| Over-all mean | | 35.56 |
| Mean by group | 31.53 | 38.30 |
| Mean by employment classification: | | |
| State | 34.97 | 36.65 |
| Federal | 25.36 | 36.84 |
| Private | 31.85 | 40.24 |
| Other | 40.06 | 41.28 |

accounted for by the calculated regression equation. The analysis of variance associated with the differences between group and between employment classes indicates a non-significant F value and a probability of a greater F of 0.15 for group differences and 0.59 for employment differences.

The differences in the levels of the means for this category are not believed sufficiently great to make a strong case in favor of the predicted trends. A stronger case can be made for the idea that the groups are little different regarding their responses to the Twenty Statements Test. This conclusion tends to support those dealing with the information questionnaire data, i.e., while there are some slight differences in responses between the groups, the groups seem more alike than different.

One fact that the writer feels can be supported by the data and which has important implications, comes in the form of a negative affirmation. Foresters as represented by this sample do not project the image of a highly outgoing, socially oriented group. These findings are supported by the I. I. Holland and Beazley (1971) study cited in Chapter II. If these characteristics are considered important traits for a significant number of foresters, the evidence here presented suggests that some major strategies will have to be established to entice such persons into it. Neither the occupational entrant nor his more experienced counterpart display such characteristics.

The Vocational Preference Inventory Results

It will be recalled from Chapter II that the Vocational Preference Inventory is a response set that gives a list of 160 occupational titles

to which the responder indicates his preference by a "yes" or "no" answer. Each title is associated with one of six global personality types which are alleged to allow for all of the occupational titles in the world of work.

Individuals are classified or scored by totaling their "yes" responses in each category. The global types and their associated job titles are in Appendix D, Table XXVIII. The category with the highest frequency is considered as the prime one. The next two responses with the highest score are included in the three letter set which categorizes the total response. Holland et al. (1970) allows that the taxonomy of the world of work is a rough estimate at present. They give a three letter set of RIS as the description for the forester.

Presumably, persons who select forestry as an occupation should have the greatest count in the Realistic category, the next highest count in the Investigative (formally intellectual) category and the third highest count in the Social group. At the outset of the study, it was believed by the author that the social category did not belong in the three digit classification. Twenty years of working in forestry had led to the belief that foresters were not a highly social group. It was believed that they would not opt for the job categories in the Vocational Preference Inventory that were associated with the social category. Further, it was believed that the outdoor syndrome was such a major force in the choice process that the perceived work environments of the various occupational titles would be of insufficient strength to elicit responses that fit any pattern which included the social grouping.

It was believed, however, that there would be differences in the responses between the two groups and that those differences would be in

the direction of more social orientation, The rationale for such a belief came from the idea that if a person is to remain in a work environment, he must have a moderate level of success as demonstrated through some level of advancement and promotion. Since it was believed that most persons aspire to higher status positions (and the foresters in this study did), then in order to be competitive for those positions they would have to overcome their social interaction reticence. It was believed that the group differences would reflect such a change.

Table X displays the grand mean for each Holland category and the means by group and by employment within group. Scanning the top line, that headed All All, one can readily pick out the top three response categories for the foresters represented by this sample. They are Investigative (6.3), Realistic (4.1), and Enterprising (3.0) and the associated acronym would be IRE, not RIS. This result may seem like a close hit since the first two categories are similar in each set, although they are reversed in order. When it is remembered that Holland's sample was entirely a college sample and the sample associated with this study is one of all practicing professionals, the fact that both the I and R are present in the acronym seems strengthening.

If such typologies are to be of value in the counseling trade, however, they should be accurate reflections of the purported work environments. They should be reasonable assessments of the various occupational cultures. The indicated miss in terms of the Holland groupings is rather a major one because it indicates what seems to be an erroneous placing of the forestry culture in terms of those occupational cultures associated with it.

TABLE X

MEAN VALUES FOR HOLLAND'S CATEGORIES BY GROUP

| <u>Group</u> | <u>N</u> | <u>Realistic</u> | <u>Investigative</u> | <u>Social</u> | <u>Conventional</u> | <u>Enterprising</u> | <u>Artistic</u> |
|--------------|----------|------------------|----------------------|---------------|---------------------|---------------------|-----------------|
| All All | 200 | 4.1 | 6.3 | 2.6 | 2.2 | 3.0 | 2.4 |
| Entrant | 81 | 4.6 | 6.4 | 2.5 | 2.3 | 2.4 | 1.8 |
| Experienced | 119 | 3.7 | 6.3 | 2.6 | 2.1 | 3.4 | 2.7 |
| Entrant: | | | | | | | |
| State | 17 | 4.1 | 5.6 | 2.1 | 1.6 | 1.8 | 1.5 |
| Federal | 21 | 5.3 | 6.9 | 3.2 | 2.4 | 2.0 | 2.3 |
| Private | 36 | 4.5 | 6.4 | 2.3 | 2.4 | 2.9 | 1.6 |
| Other | 7 | 4.7 | 7.7 | 2.6 | 2.6 | 3.1 | 2.0 |
| Experienced: | | | | | | | |
| State | 18 | 4.0 | 6.7 | 3.3 | 1.9 | 3.6 | 2.4 |
| Federal | 54 | 3.2 | 6.0 | 2.0 | 1.9 | 2.6 | 2.4 |
| Private | 31 | 4.6 | 6.6 | 3.1 | 2.7 | 4.6 | 3.1 |
| Other | 16 | 3.6 | 6.0 | 2.8 | 1.9 | 3.6 | 3.3 |

On the premise that the high two responses to the Holland categories represent the major ordering of the responding groups' interests and personality constructs, the RI sequence given by Holland et al. (1970) for forester places it in association with a constellation of work environments that are not compatible with it. Some of the other occupations given with the RI ordering are geographer, architectural draftsman, industrial arts teacher, radio operator, filling station attendant, etc.

The IR ordering for forester, found in this study, however, places forestry in a constellation of work environments which are logically compatible with it. Titles included here are agronomist, animal husbandryman, botanist, natural scientist, zoologist, and several of the engineering titles. This is a much more logical constellation of titles to be associated with forester. His academic preparation, as expressed by the curriculum, is much more nearly aligned with this latter group. In fact, he has college courses in common with many of them.

It is of supportive interest, to report that the grand mean for the total original sample of 424 respondents yields the same ordering of categories. The top three categories and their mean responses were Investigative (6.6), Realistic (4.2), and Enterprising (2.9). If the data shows that there are no group differences or if it shows them to be slight, then the pooled means can be considered a valid estimator for the three digit classification.

The results of the multivariate analysis for each of the six Holland categories taken as the dependent variable, are given in Appendix D, Tables XXIX through XXXIV. The regression equations do not

account for a great deal of the variation as evidenced by the low value for R^2 in each group. Further, the analysis of variance for group and employment differences shows significant values for F in only three locations.

There are slightly significant differences between the groups on the Artistic scale. The experienced groups mean Artistic response was 2.7 while that for the entering group was 1.8. These differences are significant only at the .05 level and are not judged to be indicative of major occupational cultural differences between the groups. It is believed that there is a normal trend toward an appreciation for the arts and other humanistic areas that is associated with age, and the differences here are suspected to be a response to that. Abe and Holland (1956b) found that the Artistic category was the lowest of the six for agriculture students which included forestry. The results of this study indicate that the Artistic categories were not quite so selected against and that they were more tasteful to the older group. This is not perceived as a major point since the Artistic mean is generally low enough so as not to be considered a discriminator in defining the occupational culture in terms of the Holland typology.

The only Holland category that showed real differences between the group and employment means was Enterprising. Inspection of Table X shows the group means as 2.4 for the beginner and 3.4 for the experienced forester. The analysis of variance giving group differences (Appendix D, Table XXXIII) indicates statistical differences between these means at the .01 level. In the case of employment adjusted for the group effect, the analysis of variance shows the differences in the employment means to be significant at the .01 level also. It can be

concluded from this that the Enterprising occupational titles are the only ones that foresters in this study tend to discriminate on. This is considered an important finding.

The rationale for the Holland typology is appealing and has considerable merit. If it adequately predicts the occupational cultural differences between constellations of work environments, it can be useful to the vocational and career counselor. In the case of the forester represented by this study it seems to do this, although not in the same combination of ways suggested by Abe and Holland (1965b).

Foresters apparently share with their fellow professionals the same global interests as represented by the Investigative category of occupational titles. The strength of these preferences is about the same for young and older foresters and they are about the same regardless of employment classification. Foresters also tend to share the same interests that are represented by the Realistic responses. These preferences are not so strong as those for the Investigative group as evidenced by the lower mean score in the Realistic category.

When the individuals get to the next set of preferences, they tend to be more discriminating. This results in the finding of significant differences between groups and employment classifications. An examination of the Enterprising model type and personality constructs found in Chapter II will reveal the reason behind such discrimination at this level. Once the major interests have been allocated to the first two categories there is some room for the individual variation to show up. Those personality types represented by the Enterprising category are of such a nature that there is plenty of room for these secondary responses to be reflected.

Once past the Enterprising category, both groups of foresters tend to steer away from the occupational titles associated with the Realistic, Artistic, and Conventional categories to about the same degree. Support for this lies in the failure of group differences to show up as being statistically significant for these categories.

It seems clear from this study that the target groups do not differ to any great degree. At least the differences demonstrated by the data and discussed throughout this chapter do not appear to warrant the conclusion that the groups are distinctly different. What this means is that foresters entering the world of work have substantially the same occupational cultural constructs as those who have had upwards of ten years' experience. While this conclusion tends to invalidate the value of seeking group differences it serves to strengthen the concept that the occupational culture associated with forestry is fairly well defined and perhaps quite narrow.

On the assumption that the 200 responses could be considered as coming from one population rather than two, the matrix giving the correlation coefficients for the mean responses was examined. The correlation coefficients and the associated probability levels are reported in Table XXXV of Appendix D. It can be seen that there is a moderately high correlation between all six of the Holland categories and little correlation between them and the per cent consensual response. This would be expected if the Holland system was to be considered a valid concept. It was disappointing that the correlation between the per cent consensual and the Holland Social category did not give more of an indication of being correlated. While the negative correlation is what

might be expected, it was not of sufficient strength to make a claim that the two were estimating the same variable.

Examining the mean responses given in Table X in the All All category and assuming no differences between the groups, it can be seen that the value for Enterprising is 3.0 while that for Social is 2.6. If one could conclude that these numbers were different beyond that of random chance, considerable support could be given to the IRE classification. Utilizing the sums of squares associated with the correlation matrix in Table XXXV, Appendix D, for the Enterprising and Social categories, a one tailed "t" test was computed for such differences. Table XXXVI in the appendix gives the model for those calculations and the resulting statistics. It can be seen that the mean scores for the two categories are significantly different at the .01 level, which gives considerable support to the idea that the IRE is a valid acronym for foresters represented by this sample. Further, this procedure gives support for the idea that the Social category is not part of the constellation of the foresters' world of work.

The summary of the results and discussion of this study and the description of the occupational culture for forestry is presented in the following chapter. While the results are not clear cut, they seem strongly to center on the idea that the two groups are more alike than different, that foresters are not highly social, and that Holland's typology for forestry is not correct as measured by professionals on the job.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

As given in the first chapter, the objectives of this study were to describe the occupational entrant and the forester with ten years of experience in terms of certain classification and response variables using a broad based national sample. There were 18 separate items of information investigated along with the responses to the Vocational Preference Inventory and the Twenty Statements Test. The conclusion for each category is given in summary form below. The data reported deals with the responses from 200 foresters whose date of first forestry employment matched the target dates selected for this study.

Summary of Findings

- 1) The mean age for the entering forester was 26.1 years, while that for the experienced forester was 36.8 years. This was an expected result because of the ten year gap in the employment target dates.
- 2) There were some differences found between the groups on educational attainment and they were attributed to age differences and not to inherent group differences.
- 3) There were substantial differences found between the groups in the distribution of their employment classification. There

was a higher number of Federal foresters in the experienced group. The differences were attributed to a shift in the Federal employment pattern and to the ten year age difference between the two groups.

- 4) There were over 35 different job titles reported by the sample respondents. Over 50 per cent of the older group reported titles that were judged to require a high degree of social skills while only 12 per cent of the entrant group reported such titles. It was concluded that if there were group differences in response to the Twenty Statements Test and the Vocational Preference Inventory regarding the social skills, they should be apparent due to these findings.
- 5) The older group had a higher marriage rate than the younger group, but both exceeded the 80 per cent level. While these differences were significantly different, they were judged a function of age rather than due to differences in the occupational culture.
- 6) There were no group differences for marital status in college. The older group apparently did not restrict their response to their marital status during the undergraduate phase of their schooling.
- 7) Both groups were found to be substantially protestant in their religious orientation. There were small differences indicated by the statistics and these were attributed to an increased number in the entrant group who fell into the "other" category.
- 8) About one-third of both groups reported being active in their religious groups. The non-response on this question tended

to cloud any conclusion and was attributed to poor sample form design.

- 9) Both groups considered themselves middle-of-the-road to conservative regarding the political spectrum. There were no group differences found in this category.
- 10) Over 40 per cent of both groups reported having been raised in communities of 5,000 persons or less. There were no differences found between the groups.
- 11) There were no differences found between the groups in father's or mother's educational attainment.
- 12) Forestry was an occupational choice that was an upward choice on an occupational prestige scale with nearly two-thirds of all respondents reporting such a shift. There were no group differences identified.
- 13) Forestry is a stable occupational choice with over 90 per cent of all respondents reporting no more than one major change while in college. There were no group differences detected for this response.
- 14) Most foresters reported satisfaction with their occupational choice. There were no group differences found even though the data appeared to indicate some small ones.
- 15) Both groups reported a desire for a terminal position higher than the position presently held, and there were no group differences found.
- 16) There were group differences found regarding veterans' status. Over two-thirds of the experienced group and only one-third of the entrant group reported having had military service. These

- differences were attributed to time and history and not to basic differences in the nature of the persons in each group.
- 17) Foresters choose forestry because they love the out-of-doors. Over 40 per cent of the respondents so indicated. The altruistic responses were not frequently given. There were no differences found between the groups regarding their reason for the selection of forestry.
 - 18) There were some differences found between the groups on the response to forestry's greatest problem. Forty-four per cent of the occupational entrants cited problems related to public relations. The experienced foresters split their concerns between public relations (28 per cent) and non-professional performance (26 per cent) of practitioners. Differences were attributed to more well-defined concerns by the older group because of their greater base of experience.
 - 19) The mean response to the Twenty Statements Test was 35.56 per cent consensual. There were no group differences located, and there were no differences between employment categories. This located foresters well into the non-consensual spectrum.
 - 20) The overall means for the top three Holland categories were found to be Investigative (6.3), Realistic (4.1), and Enterprising (3.0). There were group and employment differences located in the Enterprising category only. These differences were judged to be of low order because they were on the lowest category selected, but this finding does lend support to the workability of the three digit set. The acronym

for forestry as determined by a sample of occupational occupants is IRE.

The Occupational Culture of Forestry

As evidenced by the results of this study, the following statement is an expression of the occupational culture of forester in terms of those criteria selected for the study. The usefulness of such a statement is to focus attention upon those aspects of the culture which may be contributing to the problems of the profession which were presented at the outset of this study.

The professional forester, as represented by those responding to this study are largely from rural backgrounds. They choose forestry because of their love for the out-of-doors. There is no evidence that the decision is made with a great deal of understanding of the work environment. The choice is not openly a response to altruistic motives. It is a stable choice with little shifting from one field to another and it represents an upward shift in terms of their father's occupation. They are married, protestant, and politically moderate. They are satisfied with their occupational choice yet are not complacent about their occupational status. They are task-oriented, asocial, and prefer ambiguous work tasks. They express interests to indicate that they are masculine, physically strong, and have good motor coordination. They lack interpersonal skills and prefer concrete to abstract problems. They tend toward finding their self-concept anchors in their own internalized value systems rather than in those of the various social systems. They have a concern for their professional image, and do not feel they are well understood by the public in general.

They are very cooperative and friendly amongst foresters as evidenced by the number of responses to this study and the number of side comments made.

Implications of the Study

Typologies are useful as guides to evaluate the complexities of an occupational group and to highlight the strengths and weaknesses of the various personality constructs. The case was made at the outset of the study that there was an apparent conflict between the type of person entering the field and the type of person required to fulfill the new role of the professional. Generally speaking, forestry schools take all comers, regardless of academic strength or personality constructs. Because of the outdoor syndrome which has been documented in every study made of foresters since 1936, including this one, there is a tendency to draw prospects from a rather narrow segment of the total social-economic-cultural spectrum and from a relatively narrow range of different personality constructs. The results of this study seem to support this statement.

Recruitment tactics such as described, or the lack of them, result in what appears to be the accumulation of a disproportionate number of "look alike" into the occupational group. With the expanding role of forestry, as evidenced by the many writers in the field, there seems to be a need for a more varied mixture of different personality types so that the various work environments in forestry will have an adequate reservoir of talent to satisfy their particular demands.

The results of this study tend to support the findings of E. K. Strong reported in 1945 and tend to differ with the report of Walker,

Theoe, and Hopkins in 1972. The profession of forestry does seem to have a preponderance of persons who lack interpersonal skills, who tend away from the social situations in life and who have strong anchors in their own self-systems.

This is not intended to be taken as a severe criticism of the profession of forestry, nor is it to indicate that such strongly individualistic persons are bad for the profession. It is to suggest that if the role of forestry is expanding, and if there is a need to have a mixture of persons with a variety of personality constructs, then the profession needs to do something to stimulate the entry of such persons into its ranks.

It has been thought generally that those who have a need to differentiate their personality constructs into new areas would do so if the requirements of the job demanded it. Had this been a valid concept, the social and interpersonal aspects of the various instruments would have reflected group differences since over 50 per cent of the more experienced group displayed work environments that would require such skills. Since they did not, it must be assumed that the work environments are being filled in spite of the candidates' qualifications in these areas rather than because of them. A measure of this idea was reflected in some of the older group's responses which expressed frustration at the office work, their inability to get into the woods enough, and the constant people problems associated with the job.

It seems clear to the author that the evidence supports the idea that the occupational choice of forester is one made in response to an avocational type drive and in relative isolation from an understanding of what forestry is all about. While the frustration that this sort of

a situation brings on is not demonstrated in the expression regarding job satisfaction, it is seen in the expression of forestry's greatest problem. The idea that the public does not understand what forestry is, seems to be a recognition of the social demands that are being placed upon the profession, without the corresponding recognition that it is the professional's responsibility to cause the public to understand them. It is predictable that persons who tend away from dealing in social interactions would so react.

It is the author's opinion, based upon both experience and the results of this study, that much of the profession's problem is founded in the dilemma here indicated. There is a story to be told, the professionals recognize that it needs telling, but the personality constructs of a substantial number of its members are such that the membership simply cannot deal with, or they do not desire to deal with those activities necessary to get the story told.

Another point that needs emphasis which seems of paramount importance to the profession is associated with the response of the older group to the question regarding forestry's problem. Twenty-six per cent of the responders expressed a concern for the level of professional performance by foresters. This response was not anticipated and came as somewhat of a surprise to the author. It seems to suggest that the Society, through its educational programs, needs to investigate what is being done to impart a sense of professionalism to its fledgeling membership. When over 25 per cent of the membership in such a group, as is represented by this sample, indicate a concern for such matters, it seems evident that there is a problem which cannot be disregarded.

Recommendations for Further Study

This work has led to the conclusion that the occupational culture of forestry is bounded by fairly narrow norms. The evidence is that the profession, as represented by the study sample, is made up of a large number of similar type persons who have selected forestry through a stable choice process. There is no indication of the number of persons who initially select forestry and then change to other fields. It is thought that the transfer out rate is quite high and if it is, the reasons for changing would add considerable insight to the question of how narrow the norms really are in the profession as perceived by the college prospects. If a study of the personality constructs of the "transfer out" group was made, it could be learned if the profession is having an opportunity to draw from a wide enough variety of personality types. Such a study could be made by administering the Vocational Preference Inventory and the Twenty Statements Test to entering freshmen at a sampling of schools throughout the country and then retaining them for four years to determine completions and transfers.

Because of the finding that there were no differences between the occupational entrant and the ten year experienced practitioner, the pooled data was used to establish the acronym IRE for the sample group. While it is believed to be a valid description of the practicing forester, it should be verified through a random sampling of the total Society membership. Such an undertaking would require considerable Society support but seems justified if such global typologies are to be used by the career and vocational counseling services. It seems incongruous that the profession would not insist that it be accurately represented by the application of such systems.

The Use of Typologies in Career Guidance

One point needs to be made very clear. While the responders to this study did not indicate that career counseling was very influential in their occupational choice decision, it is apparent that it will be of more importance as time goes on. This has serious implications for the profession.

The Strong Vocational Interest Blank and the Kuder Preference Inventory are widely used instruments in the vocational counseling process. They both promote the idea that persons will be well suited to the occupational culture of forestry if they have a high preference for the outdoor interests. In addition, the highly regarded Dictionary of Occupational Titles (USDL, 1965) describes the profession as one which does not require a strong people-orientation, and it too promotes the outdoor syndrome. When the Vocational Preference Inventory materials are adjusted to project the findings of this study, it too will emphasize the negative people-orientation of the occupational culture.

If the claim is valid that the profession of forestry must broaden its recruitment base to attract a wider sampling of personality constructs, then it must face up to the fact that most of the career guidance structures are working against those objectives. Perhaps a concerted effort in the area of recruitment and career guidance is called for as the result of the recognition of this inequity.

Recommendations

The results and discussion of this study bring forth the following set of recommendations.

- 1) That the profession of forestry, through its professional society take positive steps to broaden the recruitment base with the goal of bringing more persons into it who are presently occupational deviants. This recommendation can be implemented through the:
 - a. development of a national program to change the public's attitude toward foresters and forestry;
 - b. through the further encouragement of the liberalization of the forestry educational curriculum, with substantial emphasis placed on more flexible programs and a wider variety in the social sciences;
 - c. through working with and through the career counseling professionals to discourage the promulgation of the outdoor syndrome; and
 - d. to concentrate a substantial recruitment effort in the non-rural high schools throughout the country.
- 2) That the Society of American Foresters, through its educational structures, investigate the reasons for the non-professional practices complaints expressed by the older responders to this study and that if there is a valid basis for such concerns, devise and implement programs to resolve such problems.
- 3) That the Society through its accreditation program take positive steps to help insure the resolution of the outdoor

syndrome by establishing academic minimums as a partial basis for entrance to upper division work.

- 4) Finally, that the Society of American Foresters, through its national journal, help the practicing forester recognize the social introversion problem for what it is and to develop programs through its continuing education efforts to help the practitioner work through the problems. Short courses dealing with group dynamics, educational psychology, news writing, uses of mass media communications, etc., are suggestions of the type programs recommended.

It is believed that a concerted effort will be needed on the part of the profession to deal with such complex problems. It is the author's hope that the results of this study will provide a starting place for those efforts.

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APPENDIX A

MAILED MATERIALS

2015 Glenwood Drive
Stillwater, Oklahoma 74074
September 1, 1972

Dear

You probably don't know me. Let me introduce myself. I am a professional forester with ten years experience in the pulp and paper industry and a like period in forestry higher education. I've been a member of the Society of American Foresters for twenty years. I am presently conducting a study in connection with my work towards a doctorate that I think has some real significance for forestry as a profession and I would like to solicit your help in making this study worthwhile and meaningful.

There seems to be considerable interest in just who and what foresters are. The Journal of Forestry frequently has an article or a letter that focuses upon the professional image, the professional role or the professional personality. We, all of us, tend to have stereotypes of ourselves and others but we have little evidence that they are accurate. It is my hope that this study will be a first step (on a national basis) for the forestry profession, in helping to define various characteristics about our membership. This kind of information can be used to help develop new educational programs as well as providing information that will be useful for recruitment. Don Theoe, SAF Director of Professional Programs, has reviewed the prospectus for this study and has encouraged us with it.

Your name has been selected for the study through a random procedure, as a representative member of our Society. I would like to ask that you complete the attached documents and return them to me prior to September 20, 1972. There are instructions for each form. Your time and efforts are greatly appreciated. Thank you so very much.

Sincerely,



Dave Robinson
Assistant Professor of Forestry
Oklahoma State University

DWR:sm
Attachments

The Occupational Culture of Forestry

There are twenty numbered blanks on the sheet below. Please write twenty answers to the question, "Who Am I?", in the blanks. Give twenty different answers as if you were giving the answers to yourself, not to someone else. Write the answers in the order that they occur to you. Do not worry about logic or "importance". Go along fairly fast. Fifteen minutes should be the maximum time spent on this part.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____

PLEASE TURN OVER

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Please fill in the blanks.

1. Year obtained first full time forestry employment _____. Age by December of this year _____.
2. Title of present position _____.
3. Employment Classification: State ____ Federal ____ Private Industry ____
Educational ____ Consulting ____ Other _____ (please specify)
4. In what state did you receive your degree? _____ Highest degree obtained _____.
5. Are you married? _____. Were you married as a college student? _____.
6. Religious Preference: Protestant ____ Roman Catholic ____ Jewish ____
other ____ Are you active in church activities? _____.
7. Current Political Preference: Far Left ____ Liberal ____ Middle-of-Road ____
Conservative ____ Far Right ____
8. Size community you grew up in: Farm ____ Less than 5000 ____ 5001-10,000 ____
10,001-20,000 ____ 20,001-50,000 ____ 50,001-100,000 ____
20,000 ____ 50,000 ____ 100,000 ____ over 100,000 ____
9. Father's Education: Grade School or less ____ High School or less ____
High School Grad. ____ Some College ____ College Grad. ____
10. Father's Occupation _____ (e.g. forester, engineer, etc.)
11. Mother's Education: Grade School or less ____ High School or less ____
High School Grad. ____ Some College ____ College Grad. ____
12. How many times did you change majors in college? ____ Are you a veteran? ____
13. Why did you choose forestry? _____

14. What terminal position (job title) do you aspire to? _____
15. Would you select forestry again? _____
16. What is your favorite leisure activity? _____
17. What do you consider professional forestry's most serious problem? _____

This is an inventory of your feelings and attitudes about many kinds of work.
Please follow the directions given below:

1. Mark "Yes" by the occupations which interest or appeal to you.
2. Show the occupations which you dislike or find uninteresting by marking the "No".
3. Make NO MARKS when you are undecided about an occupation.

| Yes | No | | Yes | No | |
|-----|-----|--------------------------------------|-----|-----|-----------------------------------|
| ___ | ___ | 1. Aviator | ___ | ___ | 41. Master Plumber |
| ___ | ___ | 2. Private Investigator | ___ | ___ | 42. Aeronautical Design Engineer |
| ___ | ___ | 3. YMCA Secretary | ___ | ___ | 43. Speech Therapist |
| ___ | ___ | 4. Detective | ___ | ___ | 44. Traffic Manager |
| ___ | ___ | 5. Post Office Clerk | ___ | ___ | 45. Manufacturer's Representative |
| ___ | ___ | 6. Route Salesman | ___ | ___ | 46. Author |
| ___ | ___ | 7. Electronic Technician | ___ | ___ | 47. Fireman |
| ___ | ___ | 8. Humorist | ___ | ___ | 48. Army General |
| ___ | ___ | 9. Photographer | ___ | ___ | 49. Interior Decorator |
| ___ | ___ | 10. Interplanetary Scientist | ___ | ___ | 50. Novelist |
| ___ | ___ | 11. Airplane Mechanic | ___ | ___ | 51. Power Shovel Operator |
| ___ | ___ | 12. Meteorologist | ___ | ___ | 52. Anthropologist |
| ___ | ___ | 13. Foreign Missionary | ___ | ___ | 53. Marriage Counselor |
| ___ | ___ | 14. Bookkeeper | ___ | ___ | 54. Statistician |
| ___ | ___ | 15. Speculator | ___ | ___ | 55. Television Producer |
| ___ | ___ | 16. Poet | ___ | ___ | 56. Commercial Artist |
| ___ | ___ | 17. Deep Sea Diver | ___ | ___ | 57. Wild Animal Trainer |
| ___ | ___ | 18. Newspaper Editor | ___ | ___ | 58. U.N. Official |
| ___ | ___ | 19. Nursery School Teacher | ___ | ___ | 59. Sculptor |
| ___ | ___ | 20. Lawyer | ___ | ___ | 60. Automobile Mechanic |
| ___ | ___ | 21. Fish and Wildlife Specialist | ___ | ___ | 61. Surveyor |
| ___ | ___ | 22. Biologist | ___ | ___ | 62. Zoologist |
| ___ | ___ | 23. High School Teacher | ___ | ___ | 63. Physical Education Teacher |
| ___ | ___ | 24. Quality Control Expert | ___ | ___ | 64. Court Stenographer |
| ___ | ___ | 25. Buyer | ___ | ___ | 65. Hotel Manager |
| ___ | ___ | 26. Symphony Conductor | ___ | ___ | 66. Free-Lance Writer |
| ___ | ___ | 27. Wrecker (Building) | ___ | ___ | 67. Stunt Man (Motion Picture) |
| ___ | ___ | 28. Narcotics Inspector | ___ | ___ | 68. Criminal Lawyer |
| ___ | ___ | 29. Elementary School Teacher | ___ | ___ | 69. Professional Athlete |
| ___ | ___ | 30. School Principal | ___ | ___ | 70. Carpenter |
| ___ | ___ | 31. Power Station Operator | ___ | ___ | 71. Construction Inspector |
| ___ | ___ | 32. Astronomer | ___ | ___ | 72. Chemist |
| ___ | ___ | 33. Juvenile Delinquency Expert | ___ | ___ | 73. Playground Director |
| ___ | ___ | 34. Budget Reviewer | ___ | ___ | 74. Bank Teller |
| ___ | ___ | 35. Stock & Bond Salesman | ___ | ___ | 75. Business Executive |
| ___ | ___ | 36. Musician | ___ | ___ | 76. Musical Arranger |
| ___ | ___ | 37. Prize Fighter | ___ | ___ | 77. Jockey |
| ___ | ___ | 38. Diplomat | ___ | ___ | 78. Ventriloquist |
| ___ | ___ | 39. Experimental Laboratory Engineer | ___ | ___ | 79. Army Officer |
| ___ | ___ | 40. Crane Operator | ___ | ___ | 80. Banker |

PLEASE TURN OVER

| Yes | No | | Yes | No | |
|-----|-----|---------------------------------------|-----|-----|--------------------------------------|
| ___ | ___ | 81. Radio Operator | ___ | ___ | 121. Locomotive Engineer |
| ___ | ___ | 82. Independent Research Scientist | ___ | ___ | 122. Botanist |
| ___ | ___ | 83. Clinical Psychologist | ___ | ___ | 123. Personal Counselor |
| ___ | ___ | 84. Tax Expert | ___ | ___ | 124. Cost Estimator |
| ___ | ___ | 85. Restaurant Worker | ___ | ___ | 125. Industrial Relations Consultant |
| ___ | ___ | 86. Art Dealer | ___ | ___ | 126. Stage Director |
| ___ | ___ | 87. Motorcycle Driver | ___ | ___ | 127. Explorer |
| ___ | ___ | 88. Police Judge | ___ | ___ | 128. Supreme Court Judge |
| ___ | ___ | 89. Referee (Sporting Events) | ___ | ___ | 129. Draftsman |
| ___ | ___ | 90. Truck Gardener | ___ | ___ | 130. Judge |
| ___ | ___ | 91. Filling Station Attendant | ___ | ___ | 131. Photoengraver |
| ___ | ___ | 92. Writer of Sci. or Tech. Articles | ___ | ___ | 132. Scientific Research Worker |
| ___ | ___ | 93. Social Science Teacher | ___ | ___ | 133. Psychiatric Case Worker |
| ___ | ___ | 94. Inventory Controller | ___ | ___ | 134. Pay Roll Clerk |
| ___ | ___ | 95. Master of Ceremonies | ___ | ___ | 135. Sports Promoter |
| ___ | ___ | 96. Dramatic Coach | ___ | ___ | 136. Playwright |
| ___ | ___ | 97. Blaster (Dynamiter) | ___ | ___ | 137. Test Pilot |
| ___ | ___ | 98. Mind Reader | ___ | ___ | 138. Criminologist |
| ___ | ___ | 99. English Teacher | ___ | ___ | 139. Children's Clothing Designer |
| ___ | ___ | 100. Sales Manager | ___ | ___ | 140. Truck Driver |
| ___ | ___ | 101. Tree Surgeon | ___ | ___ | 141. Electrician |
| ___ | ___ | 102. Editor of a Scientific Journal | ___ | ___ | 142. Physicist |
| ___ | ___ | 103. Director of Welfare Agency | ___ | ___ | 143. Vocational Counselor |
| ___ | ___ | 104. IBM Equipment Operator | ___ | ___ | 144. Bank Examiner |
| ___ | ___ | 105. Traveling Salesman | ___ | ___ | 145. Political Campaign Manager |
| ___ | ___ | 106. Concert Singer | ___ | ___ | 146. Cartoonist |
| ___ | ___ | 107. F.B.I. Agent | ___ | ___ | 147. Racing Car Driver |
| ___ | ___ | 108. Prosecuting Attorney | ___ | ___ | 148. Book Censor |
| ___ | ___ | 109. Factory Foreman | ___ | ___ | 149. Social Worker |
| ___ | ___ | 110. College Professor | ___ | ___ | 150. Locksmith |
| ___ | ___ | 111. Tool Designer | ___ | ___ | 151. Funeral Director |
| ___ | ___ | 112. Geologist | ___ | ___ | 152. Counter-Intelligence Man |
| ___ | ___ | 113. Asst. City School Superintendent | ___ | ___ | 153. Architect |
| ___ | ___ | 114. Financial Analyst | ___ | ___ | 154. Shipping & Receiving Clerk |
| ___ | ___ | 115. Real Estate Salesman | ___ | ___ | 155. Criminal Psychologist |
| ___ | ___ | 116. Composer | ___ | ___ | 156. Insurance Clerk |
| ___ | ___ | 117. Mountain Climber | ___ | ___ | 157. Barber |
| ___ | ___ | 118. Congressional Investigator | ___ | ___ | 158. Bill Collector |
| ___ | ___ | 119. Portrait Artist | ___ | ___ | 159. Ward Attendant |
| ___ | ___ | 120. Machinist | ___ | ___ | 160. Masseur |

The Postal Card Reminder

The response to date to the Occupational Culture of Forestry study has been exceptional. We need a few more responses to guarantee a representative sample. If you still have the material we would appreciate your taking time to complete and return it. Thank you.

Dave Robinson
2015 Glenwood Drive
Stillwater, Oklahoma
74074

APPENDIX B

THE INFORMATION SHEET FREQUENCIES
AND STATISTICAL WORK

TABLE XI

CHI-SQUARE CONTINGENCY TABLE FOR HIGHEST DEGREE EARNED

| | B. S. | Masters | Doctors | Total |
|-----------------|-------|----------|---------|-----------------|
| Entrant | 70 | 11 | 0 | 81 |
| Experienced | 81 | 29 | 7 | 117 |
| TOTAL | 151 | 40 | 7 | 198 |
| $\chi^2 = 9.68$ | | d.f. = 2 | | P > .05 and .01 |

TABLE XII

CHI-SQUARE CONTINGENCY TABLE FOR EMPLOYMENT CLASSIFICATION

| | State | Federal | Private | Other | Total |
|------------------|-------|----------|---------|-------|-----------------|
| Entrant | 17 | 21 | 36 | 7 | 81 |
| Experienced | 18 | 54 | 31 | 16 | 119 |
| TOTAL | 35 | 75 | 67 | 23 | 200 |
| $\chi^2 = 13.68$ | | d.f. = 3 | | | P > .05 and .01 |

TABLE XIII
CHI-SQUARE CONTINGENCY TABLE FOR MARITAL STATUS

| | Married | Not Married | Total |
|-------------|---------|-------------|-------|
| Entrant | 65 | 16 | 81 |
| Experienced | 114 | 5 | 119 |
| TOTAL | 179 | 21 | 200 |

$\chi^2 = 12.40$ d.f. = 1 P > .05 and .01

TABLE XIV
CHI-SQUARE CONTINGENCY TABLE FOR MARITAL STATUS IN COLLEGE

| | Married in College | Not Married in College | Total |
|-------------|--------------------|------------------------|-------|
| Entrant | 44 | 37 | 81 |
| Experienced | 73 | 46 | 119 |
| TOTAL | 117 | 83 | 200 |

$\chi^2 = 0.98$ d.f. = 1 P < .05

TABLE XV

CHI-SQUARE CONTINGENCY TABLE FOR RELIGIOUS PREFERENCE

| | Protestant | Roman Catholic | Jewish | Other | No Response | Total |
|-------------|------------|-------------------|--------|-------|-------------|-------|
| Entrant | 54 | 9 | 1 | 13 | 4 | 81 |
| Experienced | 93 | 17 | 1 | 6 | 2 | 119 |
| TOTAL | 147 | 26 | 2 | 19 | 6 | 200 |

$\chi^2 = 11.56$
d.f. = 4
P > .05

TABLE XVI

CHI-SQUARE CONTINGENCY TABLE FOR CHURCH ACTIVITY

| | Yes | No | No Response | Total |
|-------------|-----|----|-------------|-------|
| Entrant | 26 | 34 | 21 | 81 |
| Experienced | 46 | 33 | 40 | 119 |
| TOTAL | 72 | 67 | 61 | 200 |

$\chi^2 = 4.44$
d.f. = 2
P < .05

TABLE XVII

CHI-SQUARE CONTINGENCY TABLE FOR POLITICAL PREFERENCE

| | Far Left | Liberal | Middle Road | Conservative | Total |
|-------------|----------|---------|-------------|--------------|-------|
| Entrant | 1 | 14 | 33 | 31 | 79 |
| Experienced | 0 | 18 | 34 | 65 | 117 |
| TOTAL | 1 | 32 | 67 | 96 | 196 |

$$\chi^2 = 6.43$$

$$d.f. = 3$$

$$P < .05$$

TABLE XVIII

CHI-SQUARE CONTINGENCY TABLE FOR COMMUNITY SIZE

| | Farm | Less 5000 | 5001 - 10,000 | 10,001- 20,000 | 20,001- 50,000 | 50,001- 100,000 | Over 100,000 | No Response | Total |
|-------------|------|--------------|------------------|-------------------|-------------------|--------------------|-----------------|----------------|-------|
| Entrant | 16 | 18 | 11 | 11 | 5 | 4 | 15 | 1 | 81 |
| Experienced | 24 | 33 | 18 | 12 | 10 | 5 | 17 | 0 | 119 |
| TOTAL | 40 | 51 | 29 | 23 | 15 | 9 | 32 | 1 | 200 |

$$\chi^2 = 3.56$$

$$d.f. = 7$$

$$P < .05$$

TABLE XIX

CHI-SQUARE CONTINGENCY TABLE FOR FATHER'S EDUCATION

| | Grade Sch. or Less | High Sch. or Less | High Sch. Grad. | Some College | College Grad. | Total |
|-----------------|-----------------------|----------------------|--------------------|-----------------|------------------|---------|
| Entrant | 15 | 11 | 25 | 14 | 16 | 81 |
| Experienced | 32 | 26 | 27 | 13 | 21 | 119 |
| TOTAL | 47 | 37 | 52 | 27 | 37 | 200 |
| $\chi^2 = 6.02$ | | d.f. = 4 | | | | P < .05 |

TABLE XX

CHI-SQUARE CONTINGENCY TABLE FOR MOTHER'S EDUCATION

| | Grade Sch. or Less | High Sch. or Less | High Sch. Grad. | Some College | College Grad. | Total |
|-----------------|-----------------------|----------------------|--------------------|-----------------|------------------|---------|
| Entrant | 7 | 10 | 36 | 14 | 14 | 81 |
| Experienced | 17 | 25 | 38 | 17 | 22 | 119 |
| TOTAL | 24 | 35 | 74 | 31 | 36 | 200 |
| $\chi^2 = 5.70$ | | d.f. = 4 | | | | P < .05 |

TABLE XXI
CHI-SQUARE CONTINGENCY TABLE FOR FATHER'S OCCUPATION

| | Higher Than For | Lower Than For | Same As For | No Response | Total |
|-----------------|--------------------|-------------------|----------------|----------------|-------|
| Entrant | 4 | 51 | 25 | 1 | 81 |
| Experienced | 6 | 79 | 33 | 1 | 119 |
| TOTAL | 10 | 130 | 58 | 2 | 200 |
| $\chi^2 = 0.33$ | | d.f. = 3 | | P < .05 | |

TABLE XXII
CHI-SQUARE CONTINGENCY TABLE FOR NUMBER OF TIMES
COLLEGE MAJOR CHANGED

| | 0 | 1 | 2 | Total |
|-----------------|-----|----------|----|---------|
| Entrant | 48 | 28 | 5 | 81 |
| Experienced | 81 | 28 | 10 | 119 |
| TOTAL | 129 | 56 | 15 | 200 |
| $\chi^2 = 3.00$ | | d.f. = 2 | | P < .05 |

TABLE XXV

CHI-SQUARE CONTINGENCY TABLE FOR REASONS FOR SELECTING FORESTRY

| | Codes | | | | | | | | | | | Total |
|-------------|-------|----|----|----|----|---|---|---|---|----|----|-------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | |
| Entrant | 33 | 6 | 11 | 5 | 15 | 2 | 2 | 4 | 0 | 3 | 0 | 81 |
| Experienced | 55 | 8 | 10 | 12 | 10 | 4 | 1 | 4 | 9 | 2 | 4 | 119 |
| TOTAL | 88 | 14 | 21 | 17 | 25 | 6 | 3 | 8 | 9 | 5 | 4 | 200 |

$$\chi^2 = 17.29$$

$$d.f. = 10$$

$$P < .05$$

CODES

- 1 General Outdoor Responses
- 2 Through Contact With Others Such as Father, Foresters, Friends, etc.
- 3 Altruistic Responses, Conservation, Betterment of Natural Resources
- 4 Some Forest Exposure, i.e., Summer Job
- 5 Enjoyed the General Kind of Work
- 6 Counseling, Boy Scouts, FFA, 4-H
- 7 Fringe Benefits, i.e., Good Environment to Raise Family, Close to Fishing and Hunting
- 8 Science Orientation
- 9 Don't Know
- 10 Negative Responses, i.e., Better Than Engineering, Couldn't Think of Anything Else I'd Enjoy
- 11 Non-Response

TABLE XXVI
CHI-SQUARE CONTINGENCY TABLE FOR FORESTRY'S GREATEST PROBLEM

| | Codes | | | | | | | | | | | | | | Total |
|-------------|-------|----|----|----|---|---|----|---|----|----|----|----|----|----|-------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | |
| Entrant | 36 | 6 | 8 | 9 | 1 | 0 | 4 | 3 | 7 | 0 | 2 | 2 | 3 | 0 | 81 |
| Experienced | 33 | 5 | 31 | 18 | 4 | 2 | 8 | 0 | 6 | 2 | 4 | 1 | 4 | 1 | 119 |
| TOTAL | 69 | 11 | 39 | 27 | 5 | 2 | 12 | 3 | 13 | 2 | 6 | 3 | 7 | 1 | 200 |

$$\chi^2 = 22.74$$

$$\text{d.f.} = 13$$

$$P > .05$$

CODES

- 1 Concerns With Public Relations
- 2 Low Pay--Shortage of Jobs
- 3 Non Professional Performance of Foresters
- 4 Forestry's Poor Image
- 5 Too Much Concern for Forestry's Image
- 6 Lack of Adequate Technology
- 7 Land Use Problems and Decisions
- 8 Political Concerns
- 9 Infringement of Environmentalists
- 10 Problems With the Society of American Foresters
- 11 Not People Oriented Enough
- 12 Problems With Professional Forestry Education
- 13 Miscellaneous
- 14 Non-Response

APPENDIX C

THE ANALYSIS FOR THE TWENTY STATEMENTS
TEST RESPONSES

TABLE XXVII

ANALYSIS OF VARIANCE AND STATISTICS OF FIT FOR
 PCT. - CONSENSUAL AS DEPENDENT VARIABLE

| <u>Source</u> | <u>D.F.</u> | <u>Mean Square</u> | <u>F Value</u> | <u>Prob > F</u> | <u>R²</u> |
|----------------------------|-------------|--------------------|----------------|--------------------|----------------------|
| Regression | 7 | 592.09 | 1.05 | 0.40 | 0.037 |
| Error | 192 | 565.72 | | | |
| Corrected Total | 199 | | | | |
| Standard Deviation = 23.78 | | | | | |
| <u>Source</u> | <u>D.F.</u> | <u>Partial SS</u> | <u>F Value</u> | <u>Prob > F</u> | |
| Group | 1 | 1163.95 | 2.06 | 0.15 | |
| Employment | 3 | 1638.10 | 0.97 | 0.59 | |
| Group Employment | 3 | 741.14 | 0.44 | 0.73 | |

APPENDIX D

ANALYSIS FOR THE VOCATIONAL PREFERENCE
INVENTORY RESPONSES

TABLE XXVIII

LIST OF OCCUPATIONAL TITLES ASSOCIATED WITH EACH OF THE HOLLAND TYPES*

| <u>Realistic</u> | <u>Investigative</u> | <u>Social</u> | <u>Conventional</u> | <u>Enterprising</u> | <u>Artistic</u> |
|---------------------------------|--------------------------------------|--|------------------------------|---------------------------------------|-----------------------|
| Airplane Mechanic | Meteorologist | Foreign Missionary | Bookkeeper | Speculator | Poet |
| Fish and Wildlife Specialist | Biologist | High School Teacher | Quality Control Expert | Buyer | Symphony Conductor |
| Power Station Operator | Astronomer | Juvenile Delinquency Expert | Budget Reviewer | Stock and Bond Salesman | Musician |
| Master Plumber | Aeronautical Design Engineer | Speech Therapist | Traffic Manager | Manufacturers Representative | Author |
| Power Shovel Operator | Anthropologist | Marriage Counselor | Statistician | Television Producer | Commercial Artist |
| Surveyor | Zoologist | Physical Education Teacher | Court Stenographer | Hotel Manager | Free-Lance Writer |
| Construction Inspector | Chemist | Playground Director | Bank Teller | Business Executive | Musical Arranger |
| Radio Operator | Independent Research Scientist | Clinical Psychologist | Tax Expert | Restaurant Worker | Art Dealer |
| Filling Station Attendant | Writer of Scientific Articles | Social Sciences Teacher | Inventory Controller | Master of Ceremonies | Dramatic Coach |
| Tree Surgeon | Editor of Scientific Journal | Director of Welfare Agency | IBM Equipment Operator | Traveling Salesman | Concert Singer |
| Tool Designer | Geologist | Assistant City School Superintendent | Financial Analyst | Real Estate Salesman | Composer |
| Locomotive Engineer | Botanist | Personal Counselor | Cost Estimator | Industrial Relations Consultant | Stage Director |
| Photoengraver | Scientific Research Worker | Psychiatric Case Worker | Pay Roll Clerk | Sports Promoter | Playwright |
| Electrician | Physicist | Vocational Counselor | Bank Examiner | Political Campaign Manager | Cartoonist |

* The remaining 76 titles that appear on the Vocational Preference Inventory are to elicit responses to scales not included in this study.

TABLE XXIX

ANALYSIS OF VARIANCE AND STATISTICS OF FIT
FOR REALISTIC AS THE DEPENDENT VARIABLE

| <u>Source</u> | <u>D.F.</u> | <u>Mean Square</u> | <u>F Value</u> | <u>Prob > F</u> | <u>R²</u> |
|-----------------|-------------|--------------------|----------------|--------------------|----------------------|
| Regression | 7 | 13.93 | 1.51 | 0.17 | 0.052 |
| Error | 192 | 9.24 | | | |
| Corrected Total | 199 | | | | |

Standard Deviation = 3.04

| <u>Source</u> | <u>D.F.</u> | <u>Partial SS</u> | <u>F Value</u> | <u>Prob > F</u> |
|------------------|-------------|-------------------|----------------|--------------------|
| Group | 1 | 24.10 | 2.61 | 0.10 |
| Employment | 3 | 7.01 | 0.25 | 0.86 |
| Group Employment | 3 | 45.78 | 1.65 | 0.18 |

TABLE XXX

ANALYSIS OF VARIANCE AND STATISTICS OF FIT FOR
INVESTIGATIVE AS THE DEPENDENT VARIABLE

| <u>Source</u> | <u>D.F.</u> | <u>Mean Square</u> | <u>F Value</u> | <u>Prob > F</u> | <u>R²</u> |
|-----------------|-------------|--------------------|----------------|--------------------|----------------------|
| Regression | 7 | 5.73 | 0.38 | 0.91 | 0.014 |
| Error | 192 | 15.14 | | | |
| Corrected Total | 199 | | | | |

Standard Deviation = 3.89

| <u>Source</u> | <u>D.F.</u> | <u>Partial SS</u> | <u>F Value</u> | <u>Prob > F</u> |
|------------------|-------------|-------------------|----------------|--------------------|
| Group | 1 | 3.35 | 0.22 | 0.64 |
| Employment | 3 | 6.95 | 0.15 | 0.93 |
| Group Employment | 3 | 34.96 | 0.77 | 0.52 |

TABLE XXXI
ANALYSIS OF VARIANCE AND STATISTICS OF FIT FOR
SOCIAL AS THE DEPENDENT VARIABLE

| <u>Source</u> | <u>D.F.</u> | <u>Mean Square</u> | <u>F Value</u> | <u>Prob > F</u> | <u>R²</u> |
|-----------------|-------------|--------------------|----------------|--------------------|----------------------|
| Regression | 7 | 7.62 | 0.89 | 0.51 | 0.032 |
| Error | 192 | 8.54 | | | |
| Corrected Total | 199 | | | | |

Standard Deviation = 2.92

| <u>Source</u> | <u>D.F.</u> | <u>Partial SS</u> | <u>F Value</u> | <u>Prob > F</u> |
|------------------|-------------|-------------------|----------------|--------------------|
| Group | 1 | 2.59 | 0.30 | 0.59 |
| Employment | 3 | 0.57 | 0.02 | 1.00 |
| Group Employment | 3 | 45.51 | 1.78 | 0.15 |

TABLE XXXII
ANALYSIS OF VARIANCE AND STATISTICS OF FIT FOR
CONVENTIONAL AS THE DEPENDENT VARIABLE

| <u>Source</u> | <u>D.F.</u> | <u>Mean Square</u> | <u>F Value</u> | <u>Prob > F</u> | <u>R²</u> |
|-----------------|-------------|--------------------|----------------|--------------------|----------------------|
| Regression | 7 | 3.35 | 0.50 | 0.83 | 0.018 |
| Error | 192 | 6.65 | | | |
| Corrected Total | 199 | | | | |

Standard Deviation = 2.58

| <u>Source</u> | <u>D.F.</u> | <u>Partial SS</u> | <u>F Value</u> | <u>Prob > F</u> |
|------------------|-------------|-------------------|----------------|--------------------|
| Group | 1 | 0.76 | 0.11 | 0.74 |
| Employment | 3 | 13.51 | 0.68 | 0.57 |
| Group Employment | 3 | 8.46 | 0.42 | 0.74 |

TABLE XXXIII
ANALYSIS OF VARIANCE AND STATISTICS OF FIT FOR
ENTERPRISING AS THE DEPENDENT VARIABLE

| <u>Source</u> | <u>D.F.</u> | <u>Mean Square</u> | <u>F Value</u> | <u>Prob > F</u> | <u>R²</u> |
|---------------------------|-------------|--------------------|----------------|--------------------|----------------------|
| Regression | 7 | 20.90 | 3.28 | 0.003 | 0.107 |
| Error | 192 | 6.37 | | | |
| Corrected Total | 199 | | | | |
| Standard Deviation = 2.52 | | | | | |
| <u>Source</u> | <u>D.F.</u> | <u>Partial SS</u> | <u>F Value</u> | <u>Prob > F</u> | |
| Group | 1 | 48.68 | 7.65 | 0.01 | |
| Employment | 3 | 70.03 | 3.67 | 0.01 | |
| Group Employment | 3 | 15.82 | 0.83 | 0.52 | |

TABLE XXXIV
ANALYSIS OF VARIANCE AND STATISTICS OF FIT FOR
ARTISTIC AS THE DEPENDENT VARIABLE

| <u>Source</u> | <u>D.F.</u> | <u>Mean Square</u> | <u>F Value</u> | <u>Prob > F</u> | <u>R²</u> |
|---------------------------|-------------|--------------------|----------------|--------------------|----------------------|
| Regression | 7 | 9.03 | 0.98 | 0.55 | 0.034 |
| Error | 192 | 9.24 | | | |
| Corrected Total | 199 | | | | |
| Standard Deviation = 3.04 | | | | | |
| <u>Source</u> | <u>D.F.</u> | <u>Partial SS</u> | <u>F Value</u> | <u>Prob > F</u> | |
| Group | 1 | 32.32 | 3.50 | 0.06 | |
| Employment | 3 | 6.49 | 0.23 | 0.87 | |
| Group Employment | 3 | 15.42 | 0.56 | 0.65 | |

TABLE XXXV

THE PARTIAL CORRELATION COEFFICIENTS ADJUSTED FOR GROUPS ASSOCIATED WITH
HOLLAND'S CATEGORIES AND PERCENT-CONSENSUAL*

| | <u>Pct. - C.</u> | <u>Realistic</u> | <u>Intellectual</u> | <u>Social</u> | <u>Conventional</u> | <u>Enterprising</u> | <u>Artistic</u> |
|--------------|------------------|------------------|---------------------|------------------|---------------------|---------------------|------------------|
| Pct. - C | 1.000 0.000 | -0.082 0.2580 | 0.002 0.9795 | -0.130 0.0670 | -0.008 0.9103 | -0.064 0.6203 | -0.218 0.0027 |
| Realistic | | 1.000 0.000 | 0.494 0.0001 | 0.336 0.0001 | 0.434 0.0001 | 0.326 0.0001 | 0.275 0.0003 |
| Intellectual | | | 1.000 0.000 | 0.423 0.0001 | 0.355 0.0001 | 0.221 0.0024 | 0.517 0.0001 |
| Social | | | | 1.000 0.000 | 0.250 0.0008 | 0.325 0.0001 | 0.509 0.0001 |
| Conventional | | | | | 1.000 0.000 | 0.540 0.0001 | 0.171 0.0166 |
| Enterprising | | | | | | 1.000 0.000 | 0.302 0.0001 |
| Artistic | | | | | | | 1.000 0.000 |

* First number in each cell is partial correlation coefficient. Second number in each cell is probability of greater absolute value of R.

TABLE XXXVI

"t" TEST FOR DIFFERENCE BETWEEN MEAN OF
ENTERPRISING AND MEAN OF SOCIAL

Model: $\sigma_{\bar{X}_E - \bar{X}_S}^2 = \sigma_{\bar{X}_E}^2 + \sigma_{\bar{X}_S}^2 - 2 \text{Cov}(\bar{X}_E, \bar{X}_S)$

Sample Estimate = $S_{\bar{X}_E - \bar{X}_S}^2 = 0.046$

"t" = $\frac{\bar{X}_E - \bar{X}_S}{S_{\bar{X}_E - \bar{X}_S}} = 2.14^{**}$ with 192 d.f.

VITA

David William Robinson

Candidate for the Degree of

Doctor of Education

Thesis: THE OCCUPATIONAL CULTURE OF FORESTRY AS DESCRIBED BY HOLLAND'S
VOCATIONAL PREFERENCE INVENTORY AND KUHN'S TWENTY STATEMENTS
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