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Forest Management Education in Oregon

By

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With Foreword by

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"Laws and institutions must go hand in hand with the progress of the human mind. As that becomes more developed, more enlightened, as new discoveries are made, new truths disclosed, and manners and opinions change with the change of circumstances, institutions must advance also, and keep pace with the times."¹

" . . . what an organized society does each generation for its youth largely determines the future of the land."²

¹Thomas Jefferson, *Writings*, Paul L. Ford, ed. Cited in Report of the Harvard Committee, *General Education in a Free Society* (Cambridge: Harvard University Press, 1945) p. 149.

²James B. Conant, "The American Community of Scholars," *Atlantic Monthly*, CLXXVII (June, 1946) p. 90

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FOREWORD

In the fifty years since professional forestry was first taught at Cornell in 1898, forestry education has encountered a tremendously expanding profession, a rapidly enlarging technical base (once entirely borrowed from Europe but now firmly established in America), the necessity for preparing men in four or five college years to enter and to hold a wide variety of jobs, and the basic responsibility of turning out reasonably educated men who will fulfill their responsibilities as citizens

Over the years, forestry educators have struggled to meet this exacting prescription with greater or less success never satisfied with either the facilities available or with the adequacy and effectiveness of the curriculum. Professor McCulloch has made a thoughtful, helpful, and timely contribution toward achieving a better working balance in forestry education, especially as regards work in forest management

The aims of forestry education are given as self-development of men as individuals, as citizens, and as technicians—in the order named. The outstanding features of Professor McCulloch's study are the recognition of the importance of human relations and personal development both on the job and in discharging the responsibilities of citizenship and the development of a specific personnel program to meet the need. A specific program of testing, counseling, and recording personnel information is proposed to give orientation and guidance, both personal and professional. Personnel work is recognized as a definite and essential part of a professional school's job

Such a program and policy is in effect in the School of Forestry of Oregon State College. It is implemented by 50 per cent of the time of one staff member acting as head counselor and about 10 per cent of the time of other staff members. This time devoted specifically to personnel work is in addition to the many personal contacts teachers constantly have with their students. Personnel work is consequently provided for as a part of the total work load and made a part of instruction.

Regarding the forest management curriculum, an extensive analysis was made of past trends and present status of forestry employment, occupational and institutional policies and requirements, and evaluation of how education has kept pace with these developments and changes. The rise of industrial forestry in recent years and its educational needs receive particular attention. A particularly original contribution is the calibration of the Strong vocational interest test for industrial forestry. Based on these combined analyses, a curriculum is proposed (and applied at Oregon State College) aimed at achieving a desirable working balance. It is marked by a reduction in the

number of narrowly specialized courses, by an emphasis on the integrated management of both private and public forested lands rather than on forestry technics as such, and by more general educational content stressing human relations.

A thorough stock taking, as given in this study, is both encouraging and significant. It is obvious that the total volume of forestry education cannot be augmented in proportion to increases in the total volume of technical knowledge and employment opportunities. It is necessary to be selective, to reflect significant changes and developments in subject matter, and to perceive and stress fundamentals. The increasing complexity of forestry necessitates simplicity in presentation of its essential features. Like a man of fifty, forestry has reached a certain maturity making possible and increasingly important studies of the nature here reported.

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Part I. Background

Chapter 1

INTRODUCTION

The changes in social, economic, and industrial conditions in recent years have been matched by technical changes in forestry. There has been a marked evolution in forest management in the ten years prior to 1946, particularly in 1940; but forest management education has changed little, and now lags behind technological advances in the profession¹. Comparisons between professional changes and school curricula substantiate this premise. The outstanding developments in forest management in recent years have been (1) increasing complexity of public forest management; (2) expansion of industrial forestry; and (3) increasing importance of forestry personnel management.

INCREASING COMPLEXITY OF PUBLIC FOREST MANAGEMENT

Public forest management has evolved from the once simple custodianship of a relatively unused property to the complex administration of a multiple-use enterprise. In the early days, quoting the regional forester of the Pacific Northwest:

The principal job was to find out the location of the forest, the resources available to stop destructive practices and unauthorized use of the resources, and to construct simple improvements, such as trails, pastures for horses, cabins, and lookout houses. For a number of years the emphasis was placed on protection of the resource from fire and illegal use, later on the emphasis shifted to development and utilization of the resources. I would say that *we have entered a new phase in which emphasis is being placed on sound, thorough resource management*² and better utilization of the forest products³.

The same principles apply to the increasing complexity of state forest management. Twenty years ago there was no state forestry worthy of the name in Oregon; today a large, professionally staffed department functions in such diverse fields as forest management research, regulation of private lumbering operations, reforestation, fire control, and similar technical tasks.

A definitive record of the current complexity in forest management is established by a recently completed work load analysis made by the United

¹This present study proposed a revision of forest management education to meet current needs in Oregon. The curricular proposals and associated personnel program were accepted by Oregon State College and put into effect in 1947.

²Italics by the writer

³Letter from H. J. Andrews, Regional Forester, U S Forest Service, Portland, May, 1946

States Forest Service. This is one of the most exacting surveys of public forest management ever undertaken in America. As an index of the ramifications of forest management today, it shows that 200-odd different tasks are currently the responsibility of a forest ranger.

The increasing complexity of all forms of public forest management makes greater demands upon public foresters than ever before. Forestry education should prepare men adequately to meet enlarged management responsibilities. Provision should be made for the broad education of forest managers rather than forest technicians. Forestry school procedures, however, still place emphasis on the technical skills which were applicable in the early days of technical forestry.

In a later section of this monograph, trends in public forest management are analyzed and current practices are evaluated, to give direction to public forestry phases of a proposed curriculum in forest management.

EXPANSION OF INDUSTRIAL FORESTRY

Twenty-five years ago, the United States Forest Service was almost the sole employer of forestry graduates. In recent years in the West, both the forest industries and the states have employed as many or more men than the Forest Service. Industrial forest management, which scarcely existed twenty years ago, has become the most significant development in Pacific Northwest forestry, and today is practiced upon several million acres in this region. A great leader in industrial forestry in America indicates the scope of this development in the following words:

The western states are destined to be a proving ground of commercial forestry in America. Here the tide of conservation thinking has caught up with the harvesting of virgin stumpage. The economics of forest supply and use are striking a balance, and the timber crop offers possibilities of profit. These changes are coming while there is yet time to carry part of our old growth forests over into some form of sustained yield. Within the limits of sound analysis and business prudence, opportunity for forest industries based upon timber cropping rather than liquidation is knocking at our doors. The old order of American forest industry is changing. The new order of timber cropping and sustained production is on the way.⁴

Despite the importance of industrial forestry, the management curriculum in schools of forestry generally has not taken cognizance of industrial forest management. Recognition of this new field is required if the forestry school is to fulfill its obligation to all of forestry.

In a later section of this monograph, trends in industrial forest management are analyzed, and current practices are evaluated to give bases for consideration of industrial forestry in the revised management curriculum.

⁴W. B. Greely in Bruce Hoffman, *Management Possibilities in Douglas Fir Forestry* (Washington: Pack Forestry Foundation, 1941) foreword.

INCREASING IMPORTANCE OF FORESTRY PERSONNEL
MANAGEMENT

The importance of this phase of forestry has recently aroused the attention of foresters through an analysis of the interests of Forest Service personnel by Dr. E. K. Strong, Jr., of Stanford University.⁵ He finds that forestry schools are graduating men disinterested in the administration of men. Dr. Strong suggests that it might be necessary eventually to recruit administrators from non-forestry sources, a most undesirable situation from the standpoint of professional forestry, and a sad commentary on the lack of administrative concepts in forestry schools.

Forestry schools generally have attempted to train technicians at the expense of developing future administrators because employees and employers were preoccupied with technical skills. Forestry graduates cannot be expected to display administrative capacities when their time has been chiefly occupied with such nonadministrative matters as the number of seeds in a bushel of Douglas-fir cones.

We have come to expect that college graduates will be proficient in technical training, but lacking in administrative training. They are unacquainted with personnel management and we are forced to give it to them on the job.⁶

Industrial employers also recognize the need for more broadly educated foresters and are recruiting men with an eye to their eventual development rather than their current skills. The trend is manifested in the endorsement by the Pacific Logging Congress of industrial job training to complement college education. The Willamette Valley Logging Conference made this a prominent topic at its November 1945 meeting, and the Pacific Logging Congress again featured cooperative job training and college education at its annual meetings in 1946 and 1947.

It is recognized by forestry personnel managers that more men fail in forestry careers from a lack of personal development than from technical incompetence.⁷

less than one per cent of the dismissals and failures to advance in forestry are due to defective training, education, experience, or intelligence. Nearly all disciplinary cases are due to personal traits of character.⁸

⁵Edward K. Strong, Jr., "The Interests of Forest Service Men," *Educational and Psychological Measurements*, V (Summer, 1945) pp. 157-171.

⁶Letter from Howard T. Phelps, Division of Operations, U. S. Forest Service, Portland, January, 1946.

⁷Letter from A. R. Standing, Asst. Regional Forester, Chief of Personnel Management, U. S. Forest Service, Portland, October, 1945.

⁸L. A. Holmberg, "Where do our Forestry Schools Fail?" *Journal of Forestry*, XLIV (June, 1946) p. 441.

Since forestry has become so complex and foresters so interdependent, that forester is likely to succeed best who succeeds best in the society of his fellow men. This basic principle is stated in the following quotation:

Education . . . is becoming an instrument by which man brings rationality into the process of social change. More specifically, modern curricula reflect the growing realization that interdependence is replacing individualism in many areas of life, particularly in economics. The great purpose of the school, therefore, is to prepare students for participation in an evolving, democratic, industrial society in which the individualistic and small-scale social activities of a century ago are rapidly being replaced by large-scale cooperative arrangements requiring new orientations on the part of all citizens.

The evolution of this broadened social purpose reflects itself in a number of ways in advanced courses of study. Instead of making the mastery of skills and facts the central purpose of school work, this objective is looked upon as a phase of an integrated process in which acquisition of desirable attitudes is the goal.⁹

The application of this statement to forestry is acknowledged by the Operations Division of the Forest Service for the Pacific Northwest, in this statement:

The district ranger is the down-to-earth land manager. As such he should know and deal personally and intimately with all the physical resources of his district, *the people dependent thereon, and the employees through whom he gets work done* . . .¹⁰

Personnel work and course work are but two approaches to the one objective of developing the well-rounded individual. Therefore, *a personnel program to develop competence in these phases should be made as much a part of the educational program as classroom instruction*. This important obligation cannot be left solely to one or two courses in management or administration. The accomplishment of the objective will depend upon the re-orientation of many courses away from the "technique" concepts of technical forestry toward the "administration" concepts of forest management. Constant effort will be required to develop the administrative potential of the students in as many courses as possible.

The above-mentioned considerations affecting forest management education have been carefully analyzed for several years. From the analysis a new educational program in forest management is suggested. It includes (1) revision of an existing curriculum for public forest management to include industrial management considerations and (2) initiation of an intensive personnel system to complement the instructional phases of the program.

Criteria applied to the selection of general education materials were those of the Society for the Promotion of Engineering Education, the Society

⁹John K. Norton, and Margaret A. Norton, *Foundations of Curriculum Building* (New York: Gunn and Company, 1936) p. 551.

¹⁰U. S. Forest Service, *Operation Manual* (Portland: January, 1946), I, no. 284, p. 5. Italics by the writer.

of American Foresters, and the General Education Committee of Oregon State College. Criteria applied to the selection of professional course materials were those of the accrediting Society of American Foresters, the requirements of public and industrial forestry, and the requirements of civil service commissions. Criteria applied to the selection of personnel procedures were those of employing agencies and of personnel chiefs in the profession. Before examining either instructional or personnel phases of forest management education, however, it is necessary to review the backgrounds of forestry in the nation and in the state, because both affect forest management education as it is today and as it should be changed for tomorrow.

Chapter 2

DEVELOPMENT OF FORESTRY IN AMERICA AND ITS RELATIONSHIP TO FORESTRY EDUCATION

Forestry education in America did not spring up overnight. It evolved gradually, paralleling the development of forestry itself. The background of forestry education today is therefore best illustrated by the evolution of forestry in America.

The traditional starting point for a survey of American forestry is the charter issued by William and Mary defining the limits of the Province of Massachusetts Bay in 1691. One of the provisions of the royal decree reserved the best trees for spars for the British Navy, and private individuals were forbidden to cut pine trees larger than two feet in diameter. This policy was vigorously enforced until the Revolutionary War. The colonies themselves initiated some forest protection measures; among them were restrictions upon uncontrolled burning in the Massachusetts Bay Colony, and William Penn's provision for forest seed sources as early as 1681.¹ A constructive forest ordinance in New York in 1701 urged perpetuation of the resource, and in Massachusetts Bay in 1744 a law permitted forest land owners to organize for purposes of forest management.² None of the colonial forestry measures had any observable bearing on later forestry education.

The United States continued to extend forest restrictions, chiefly having to do with trespass on public lands and intended mainly to protect a supply of naval timbers. A constructive action by President John Quincy Adams was to establish a short-lived forest experiment station in Florida in 1828.³

Throughout the first half of the nineteenth century the vast frauds perpetrated upon the forests of the public domain were casually recognized and feeble attempts were made occasionally to enforce trespass regulations. The period was not characterized by honesty on the part of public officials, nor by a sense of social responsibility on the part of the electorate. The belief was common that forest lands should be cleared and put into farm lands at

¹Legislation intended to accomplish the same purpose, but less effective than Penn's edict, became a law in Oregon two hundred and sixty years later.

²The first comparable organization of forest land owners in Oregon occurred in 1942 with the formation of the Willamette Valley Tree Farms.

³Cameron Jenks, "Who Killed Santa Rosa?" *American Forest Life*, XXXIV (May 1, 1928) pp 263-266, 312.

the earliest opportunity. Timber was viewed as a nuisance to the extension of agriculture, and the plundering of public forests was condoned, if not approved

This circumstance made an accidental contribution to American forestry education. The excesses of forest exploitation finally aroused public-spirited citizens, and slowly there developed a realization of the need for forest conservation. The conservation movement, at first wholly removed from forestry education, set in motion a train of circumstances which eventually exerted a profound influence on the education of foresters. The American Association for the Advancement of Science in 1873, and the newly founded American Forestry Association in 1875, both urged legislative action for conservation of the forests. Particularly at the instance of the American Association for the Advancement of Science, a Division of Forestry was established in the Department of Agriculture in 1876. Public attention was awakened, and public pressure forced the reservation of some timberlands through an act passed in 1891.

This interest in forestry resulted in demands for education in the newly popular subject. The establishment of Arbor Day heightened the concern with forestry, particularly in the prairie states. As a direct result, lectures and courses in forestry began to appear in the land-grant agricultural colleges, and it was taught as an incidental subject in some twenty-two such institutions prior to 1897. The instruction was chiefly concerned with tree planting. This reflected the forestry interest of the settlers who were migrating from the forested areas east of the Mississippi to the treeless plains. Tree planting was generally assumed at that time to be the ultimate concern of forestry, and pre-professional instruction ignored forest management, forest practices, and forest protection.

In 1881, Professor Spalding of the University of Michigan (not himself a forester) "inaugurated a series of forestry lectures which dealt in broad terms with forest products, early laws and customs, the necessity of suitable legislation, and the influence of forests on human affairs"⁴. Probably the first professional forestry instruction given by a trained forester was that of Dr. A. B. Fernow at Massachusetts Agricultural College in 1897. Fernow devoted most of his efforts to arousing public opinion in support of legislation for conservation of the forests. Early-day forestry education followed the same pattern, and the forester from 1880 until about 1900 was chiefly a crusader, interested more in influencing public opinion than in the technical

⁴A. P. Steigerwald, "The Development of Forest Education at the University of Michigan," *Michigan Forester*, XVIII (1937) pp. 18-19

aspects of forestry⁵ Little administration was given the forest properties. Conservation and preservation were assumed to be the same thing, and it was felt to be sufficient just to set aside the forests and prevent their abuse, or use In 1900 there was little practice of public forestry as we now know it, and private forestry was almost wholly confined to forest parks on the great estates.

In 1897 a federal forest service was established to manage the forest reserves which had been set aside from the public domain. It became apparent that numbers of forest technicians would be required, and in 1898 the first professional forestry courses were offered. A four-year program was established at Cornell in that year, and a one-year course was also offered at the Biltmore Forest School in North Carolina. The Yale School of Forestry was established in 1900, and a Department of Forestry was initiated at the University of Michigan in 1903

In 1905, the administration of the federal forest reserves was transferred from the Department of the Interior to the Department of Agriculture. Under the aggressive leadership of President Theodore Roosevelt, the principle of government concern in conservation was established, and a tremendous extension of federal forestry took place at his insistence. Gifford Pinchot, newly appointed Chief Forester of the United States, found himself faced with the administration of over 60 million acres of forest land, with slightly over 800 men. The need for trained foresters was urgent and obvious, as more and more forest reserves were set aside from the public domain of the West.

Coupled with the apparent need for foresters was the fact that forestry was closely identified with the romantic tradition of America; the hunters, trappers, *voyageurs*, *coureurs-de-bois*, and other colonials were all a part of the forest. Though the frontier era had passed, its traditions persisted, and its mores were deeply ingrained in American youth. Many young men sought to recapture the adventure and excitement of pioneer days by becoming foresters A new profession had appeared, carrying an appeal of adventure and romance, offering opportunities for immediate employment, and affording an unlimited field of public service.⁶

⁵The following statement appeared in a Forest Service publication *after* the sentence above was written "The pioneer foresters were zealous crusaders in the cause of conservation Although the *idea* of conservation is more widely accepted today, the *practice* of conservation is still far from being generally applied A crusading spirit in the public interest still is strong in the forestry profession; it must continue so" U S Department of Agriculture, *Careers in Forestry*, Miscellaneous Publication 249 (Washington Government Printing Office, 1945) p 2

⁶Henry S Graves, and Cedric H Guise, *Forest Education*, (New Haven: Yale University Press, 1932), p 13.

In consequence of this interest, forestry schools sprang up in many states. Of the forestry schools functioning in 1947, seven were founded before that of Oregon State College in 1910, and in addition sixteen of those founded since 1910 are still in existence.

In 1910 there had been no intensive inventory of the public forests, and it was apparent that large numbers of technicians would be required to identify, classify, measure, and protect the forest property. In the early days of the U. S. Forest Service it was necessary that the foresters within that organization should do much custodial and developmental work, for that was the immediate job. Writing in 1910, Professor Graves of the Yale School of Forestry said:

Federal forest officers in charge of the National Forests are largely occupied in preliminary organization, reconnaissance, boundary work, surveys, cruising, land classification, settlements, construction work, etc.¹

The forests were generally remote from civilization and divorced from business enterprises, and the forester's social contacts were few. He was fully competent if he knew such techniques as identification, classification, and so forth. Consequently, forestry education in the first few years of the twentieth century was adequate if it instructed in such fields. Technical considerations alone sufficed to make a successful forester. A survey of the catalogs of the forestry schools of that period reflects this belief.

The last forty-five years have witnessed a gradual transition from forest conservation as an end in itself to *planned forest management* as a means to better forest land use. There has been some change in forestry education in recognition of this fact. The concern of the first schools of forestry was solely with the forest, now they are becoming concerned with the effects of forest use on the social structure and economy of the nation.

The forester today still possesses something of the crusading spirit displayed by his predecessors in 1880; he is dissatisfied with current progress in forest management and is actively concerned in advancing the principles of wise resource use. The forester today is no longer limited to a narrow technical concern with trees, he has become an administrator, a business man, and a molder of public opinion. His current responsibilities go far beyond the 1910 concern with identifying, measuring, and preserving the forest, now he must perpetuate the forest resource through the wise *use* of all the forest values for the greatest benefit of society. There are no more remote forests; private logging and public access roads have opened up the hinterland to extensive logging operations, and foresters are in constant contact

¹Henry S. Graves, "The Aims and Organization of the Professional Forest School," *Forestry Quarterly*, VII (March, 1910) p. 2

with the industry and with the public. The limited professional needs of a forester, which were adequately met by following the curricula of 1910, have been replaced by the modern necessity for a broad concern with the effects of forest use upon society. To be able to understand people and to work effectively with them is as germane to success in forestry today as it was to be able to know and to work effectively with trees in 1910. Forestry educational procedures today should reflect this change though many of them do not.

In Oregon, the pattern of forestry education closely followed that described above for the nation as a whole. There are specific differences, however, between national and local forestry, chiefly occasioned by the character of the forests and of the forest industries in Oregon.

Chapter 3

DEVELOPMENT OF FORESTRY IN OREGON AND ITS RELATIONSHIP TO FORESTRY EDUCATION

Forestry is perhaps more prescient of a successful future in Oregon than in any other state. The lessons of wise resource use, of forest management, were not learned in time to be of avail in New England or the Lake states. After the inescapable results of resource misuse had been demonstrated, it was too late to practice the hard-earned knowledge that forests must be perpetuated just as any other crop.

The Northwest and the Southeast are now the principal sources of the nation's lumber. In the Northwest, the forests of Washington for many years were more heavily exploited than those of Oregon, and the application of sustained yield principles will be rendered more difficult in Washington by the extent of that difference.

In Oregon, however, a tremendous forest asset remains uncut. Here stands nearly one-quarter of all the commercial saw timber in the United States; here the forests cover 46 per cent of the state, here the lumber production leads all other states, and here (in 1947) forest products contribute more than \$300 million to the economy of the state. A resource of this magnitude is sufficient to make possible the establishment of a perpetual forest industry at a high level of production—*provided that sound forest management principles are applied promptly and effectively*. The soundness of this forest management will depend upon the education of the forest managers.

Reviewing briefly the development of forestry within the state, three periods are identifiable, each with implications for forestry education. First was the period prior to 1907 characterized by *apathy*; the period roughly from 1907 until about 1940, characterized by increasing public *attention*, and the period since then, characterized by *action* on the part of governmental and industrial foresters, and the public.

PERIOD OF APATHY

The Oregon that lured the pioneers was a green estate. Timber had value to these people, for it provided logs, shakes, and timbers for their cabin, fuel for the fireplace, posts and poles for fences, and materials for furniture and for many of the crude tools and implements they used in everyday life. While the value and necessity of the forest were evident to the pio-

neers, they made no attempt to conserve it. Careless land clearing and incendiarism were common, and evidences of old fires now scar the Pacific slopes.

Oregon's first step in forest conservation was not prompted by any desire to save the timber. Fire in the forest was considered a menace only when it threatened communities. The preservation of the vast expanse of woods in the hinterland was of no concern. In 1864 the first fire law was passed but the intent was to save farms and homes, not the forest.¹ There was no public interest in forestry until about the turn of the century when the legislature made an ineffective gesture. It placed the responsibility for enforcement of forestry laws upon the shoulders of the "state game and forest warden." Since there were no forestry laws of any moment to enforce, nothing was done.

The lack of concern for forestry was paralleled by a lack of concern for forestry education. Prior to 1905 there was apparently little demand for education in this field, although in 1896 one course in forestry was given by the Botany and Horticulture Department of Oregon Agricultural College. This was, however, a non-professional, nature-study type of course, not designed to educate foresters. The same considerations applied when the one course was expanded to three courses in 1903. These were elective courses and were not intended for the professional education of foresters.

PERIOD OF INCREASING PUBLIC ATTENTION

Before 1907, Oregon's forest resource was considered to be inexhaustible. The belief was general that conservation measures which might be necessary elsewhere had no application here. In 1907, however, President Theodore Roosevelt set aside millions of acres of western public domain lands as national forest preserves, including practically all the unappropriated public timber lands in Oregon. This circumstance was appreciated by the more enlightened citizens of the state, as shown in the report of the president of Oregon State College for the same period. It says of the forest resource

What a marvelous source of wealth. What a fertile field for labor! How significant the wage income implied by such a gigantic resource! It bespeaks happy industrious homes, a rich commerce, a prosperous, contented, developed people—a great state! What is more important than that we wisely husband such a resource?²

Not all the citizens of Oregon were equally conscious of civic responsibility in respect to natural resources, and unscrupulous speculators defrauded

¹This law was still on the statute books of the state in 1947.

²*President's Biennial Report, 1906-1907, 1907-1908* (Corvallis: Oregon Agricultural College, 1909), p. 138.

the taxpayers of some of the most valuable timberlands in America. One report of the times said:

a United States Senator, a Congressman, two former United States Attorneys, several members of the State Legislature, and others of more or less political renown were actually convicted, while another Congressman, numerous personages in the millionaire class, and many others of greater or less degree of prominence in the political, commercial and social sides of life have been indicted and are now awaiting their fates with chilling marrows³

A compensating factor in these land frauds was that they did cause such excitement. Public spirited citizens in Oregon were made aware of the need for forest conservation as they never had been before.

Because of the terrible fires of 1910 throughout the entire Northwest, the Oregon legislature in 1911 passed effective forestry laws establishing a state board of forestry and installing a state forester. There was public support for this new venture in resource conservation, and the state board of forestry began a policy of close cooperation with timberland owners in forest protection. In the absence of a strong state organization at that time, private forest protective organizations were encouraged. Progressive forest fire legislation sustained the work of these agencies.

For more than two decades the activities of the state forestry department were confined largely to forest protection. In 1929 came an advance beyond fire fighting activities, with passage of an act to make timberland taxation more equitable. This legislation encouraged the private timberland owner to retain title to his cut-over lands. While all the original hopes for this act have not been fulfilled, it is significant in recognizing for the first time the possibilities of industrial forestry in the state. Because of inequitable taxation and other factors, private forest owners had frequently allowed their lands to go tax delinquent as soon as the timber was cut. Now it was possible to hold the cut-over lands, and graduate foresters were engaged to manage them.

Before this period the forest industry had not been important in directly arousing the public's interest in forestry. It *was* an important agent affecting the public economy, and this in turn affected public opinion. In order to secure the advantages of mass production, some mills installed a cutting capacity in excess of the timber growing capacity of tributary forest lands. As the timber was rapidly cut off, lumber-dependent towns ran through a cycle from prosperity to poverty. In consequence, an unfavorable public

³Horace Stevens, foreword in Stephen A. Douglas Puter, *Looters of the Public Domain* (Portland: The Portland Printing House, 1908), p. 8. This book was written by Puter, self-styled King of the Oregon Land Fraud Ring, while serving a jail sentence for looting the public domain.

reaction was built up toward the industry. A cut-out-and-get-out policy was practiced by some operators for a variety of reasons, some defensible and some not. The net result was the temporary abandonment of logging towns, and the building up of a public opinion against clear cutting, and *for* regulation of forest operations. This latter circumstance eventually contributed to the practice of forest management by the industry.

Shortly before the war, industrial forest operators began substantial efforts to demonstrate that past practices were not the future purposes of a majority of the industry. The magnificent contribution of lumber to the war effort was another factor publicizing the importance of industrial forestry, and Oregon's lumber production finally surpassed that of Washington, to lead the nation in value and volume of production.

This great development of the industry in Oregon was accompanied by an increasing awareness of its forestry responsibilities. It became obvious that long-time operations in the forest required the attention of forest managers. As a result, the demand for graduates interested in local industrial forestry for the first time equalled the demand for those interested in national public forestry.

Throughout the period just described, from about 1907 until 1940, the national public forestry agencies were by no means static.

The first federal forest established in Oregon was the Cascade Forest Reserve, set aside from the public domain in September 1893. It included most of the present Mt. Hood, Willamette, Umpqua, and Rogue River National Forests. Today, there are nine additional National Forests in Oregon and their total area of some 12 million acres is approximately double that of the original federal forest in the state.

The early-day custodianship type of administration gradually yielded to more comprehensive forest management, touching the daily lives of those interested in grazing, in fishing and hunting, and in forest recreation,⁴ and in watershed protection, as well as timber. These diverse contacts attracted a wider range of public attention to forestry than ever before.

In the latter part of the period, two other developments highlighted public forestry in Oregon. One was the work of the Civilian Conservation Corps, not restricted solely to federal forestry work, but chiefly centered there. The return of forestry-minded CCC enrollees to their local communities built up a considerable public awareness of forestry problems. The other development was the establishment in Oregon of an entirely new federal forestry agency.

⁴The United States Forest Service now maintains over 300 forest recreation campgrounds in Washington and Oregon.

to administer the Oregon and California Railroad grant lands in the western part of the state. The older federal forestry agencies, the forestry division of the Indian Service, and the United States Forest Service, continued to expand throughout the years. The latter service became by far the largest employer of foresters in America.

All of the foregoing developments, the rise of state forestry, the great expansion of the lumber industry, and the growth and diversity of federal forestry, served to direct public attention to forestry. The apathy of prior years was replaced by an enlightened interest which set the stage for action in ensuing years. The results were manifested in public support of state and national legislation looking toward perpetuation of the forest. The national "Sustained Yield Bill" and the Oregon "Forest Conservation Act" both have had, and will continue to have, far-reaching implications for forestry education. To appreciate these circumstances more fully, it is desirable to review the development of forestry education in Oregon through the same 1907-1940 period which culminated in passage of these significant forestry laws.

From about 1907 until just prior to World War II, forestry education in the state agricultural college experienced a steady growth. The early beginnings were modest. By 1905 the three forestry courses mentioned earlier had become twelve, and forestry was an official "Course of Study" in the newly-created Department of Botany and Forestry. The course in forestry was "designed to meet the needs of men who desired to enter the government forest service, or to fit themselves to care for the forest areas of private owners."⁵ The student was required to have an actual working knowledge of

packs and packing, trail and road making, camp equipage, camp making, camp fires, water supplies, camp cooking, woodsmen's tools, their use and abuse, use and care of fire arms, dressing and preserving game, care of skins, furs, hides, and pelts.⁶

This concept of forestry reflected little more than the woodsman's limited approach to forest techniques. A deeper interest was soon aroused, however, by the conservation activities of President Theodore Roosevelt. This attention to forestry was shared by students at Oregon Agricultural College, some of whom petitioned President William Jasper Kerr for more thorough instruction in forestry. The president's biennial report for 1906-1908 states

There is an increasing interest in the course in Forestry. The number of students enrolled is much larger than during the preceding year, and the attendance would be still greater if the department were properly equipped for the work.

⁵*Catalog* 1905-1906 (Corvallis: Oregon Agricultural College, 1905), p. 128. Despite the announced purpose of fitting men to care for private forests, no provision was made for industrial forestry education.

⁶*Ibid.*, p. 131.

For years emphasis has been placed upon certain lines of agriculture that represent an annual income to the state of less than one-fourth of the income from the forest industry, and yet comparatively little attention has been given to the importance of forestry education¹

More attention *was* given forestry education in the same year. The "course of study" was made a department, and the former professor of botany and horticulture was made professor of forestry. The development of forestry education was further advanced in the first half of 1910, when the department was placed on a professional basis with a trained forester, George W. Peavy, in charge. In 1913 the department was made a school, and the incumbent head of the department became dean of forestry.

The circumstance which brought about early forestry education in Oregon, chiefly the attention to conservation of national resources, was responsible for the character of that education. It was designed to prepare men for work in the federal forest service, which was actively espousing forest conservation. This purpose was held in common with nearly all the forestry schools in the United States. In 1911, the head of forestry instruction at Oregon Agricultural College was made a member of the state board of forestry, but this fact had little effect upon forestry instruction. The chief influence upon the curriculum was still that of federal, rather than state forestry. The federal forest service was well established by this time and was practically the only source of employment for forestry graduates. State forestry as yet offered negligible opportunity, and the lumber industry at that time was occupied with the lumber business rather than with forest management. For these reasons, early forestry education in Oregon was concerned chiefly with the techniques of federal forestry. The limited concept of such responsibilities was reflected in the designation of the course work as "technical" forestry, rather than forest management.

In 1913 the needs of the expanding lumber industry received recognition, and a department of logging engineering was established in the School, primarily at the request of the Pacific Logging Congress. In 1927 a department of wood products was added to the School of Forestry to round out the cycle of forest production, log production, and wood production. This last curriculum prepared men for the manufacturing and merchandising of wood products.

PERIOD OF ACTION

In 1941 several events occurred to accelerate the rapidity of change in forestry. In consequence of the increasing public attention to forest prac-

¹*President's Biennial Report, 1906-1907, 1907-1908, op. cit., p. 83*

tices, increasing agitation developed for some form of control of private logging operations. It became obvious that the economy of Oregon largely rested upon regeneration of the forest. The industry took definite steps in this direction, the most convincing being the sponsorship of the Oregon Forest Conservation Act. This law was passed in 1941 with the endorsement of far-sighted industrialists and with public support. It was the first attempt at state control of logging operations. While the original law required only a minimum of silvicultural measures for compliance, it was a strong step ahead in forestry development in Oregon. It brought about an awareness of the place of forest management in industry, and it encouraged the employment of more forestry school graduates in industrial work than ever before. Also in consequence of the Act, the State Forestry Department was forced to enlarge its staff of professionally trained foresters. For the first time in the history of Oregon, the demand of the State Forestry Department for trained foresters exceeded the demand of the United States Forest Service.

Other significant events took place in Oregon forestry about 1941. These included: (1) the establishment of the Oregon Forest Products Laboratory, devoted to research in wood products; (2) the establishment of sustained yield tree farms by the industry;⁸ (3) greatly increased timber-sale activity on the part of public forestry agencies; (4) the beginnings of county forestry, as a result of industrial forestry demand for county timber; and (5) the establishment of the Keep Oregon Green Association. This latter movement, nonpolitical, nonpartisan, was designed solely to protect Oregon's field and forest crops. Public support of Keep Oregon Green demands action from foresters to meet the obligations of responsible forest management.

During the period of increasing public attention to forestry, roughly from 1907 to 1940, the forestry school at Oregon State College also received more attention. It enlarged along with the profession and industry, the graduating class of four in 1910 increasing to almost 100 in 1939. At that latter date, in numbers of both staff (12) and students (555), the school was second only to the New York State College of Forestry among the nearly 30 American forestry schools then in existence. Forestry education in Oregon in 1940, however, still *followed* the trend of forestry. It is generally acknowledged that the early program of the School of Forestry was adequate for the needs of the early days of forestry in the state. The needs have now changed, the technology of forestry has advanced, and forestry education

⁸The Willamette Valley Tree Farms, a cooperative industrial forest management agency, was planned in 1941 and began operation early in 1942. In 1947 seven professional foresters in this organization were serving in the industrial forestry needs of the six member companies.

must not lag. The 1940 curriculum, suited to prewar requirements, now requires adaptation to postwar realities.

In a later section of the monograph these realities are examined to give direction to educational purposes in forest management. A philosophy of education in forest management, however, comprehends more than mere facility in professional skills; the development of the individual and of the citizen are implicit obligations. The following chapter deals with these factors which condition a philosophy of forestry education in Oregon.

Chapter 4

A PHILOSOPHY OF FORESTRY EDUCATION

"Philosophy of Education" is the endeavor to formulate the problems involved in the formation of the right moral and mental attitudes needed to meet difficulties in the contemporary social life¹

Mursell says: "An intelligent working philosophy is simply the most comprehensive policy we can frame, based on the most comprehensive interpretation of existing realities we can achieve."² A number of existing realities will qualify forestry education. The discussion below summarizes the major factors which will govern a philosophy of forestry education in the state of Oregon.

In the first place, forestry education in Oregon is a responsibility of the State Board of Higher Education. The aims for which the Board strives must also be the aims of its subordinate divisions, such as the School of Forestry. These aims were stated by Chancellor Hunter as follows:

The state's purpose in maintaining an educational establishment is to provide the working essentials for the prosperity and progress of this free democratic commonwealth as a governmental and economic unit of a great free nation, which in turn is a member of a world union of nations. It is reasonable to expect from such a department of higher education, steadfastly adhering to the above stated purposes, certain concrete outcomes.

A body of citizens devoted, not only to personal achievement, but also equally loyal to the responsibility of carrying on the ideals of Christian civilization and free democratic society.

A qualified and adequate manpower for the professions and principal vocations, including a liberally educated and professionally prepared teaching staff, as well as a highly trained and broadly educated nucleus of scholars, scientists, and technologists.³

A second factor affecting a philosophy of forestry education in Oregon is that forestry is taught at Oregon State College, a land-grant institution. The School of Forestry must, therefore, function within the educational philosophy of a land-grant college. President Strand expresses the educational philosophy of the State College as follows: "We have obligations to fulfill (1) to the student, (2) to the people of the state and nation, and (3) to the industries we serve. The relative importance of these obligations is represented by the above order."⁴

¹I. B. Berkson, *Education Faces the Future* (New York: Harper and Bros., 1943) p. 19.

²Jas. M. Mursell, *Education for American Democracy* (New York: W. W. Norton, 1943) p. 117.

³Frederick M. Hunter, *A Tentative Statement of Purposes and Means* (Eugene: University of Oregon, June 1946), p. 1 (Mimeographed).

⁴Letter from A. L. Strand, President, Oregon State College, October 1945.

Each of these three points bears upon a philosophy of forestry education, and is amplified below

(1) Student foresters are individuals before they are technicians. Hence, forestry education must enhance the capable and abundant living of its students as individuals, if they are to succeed as technicians. The most competent individual is likely to be the one most in harmony with his environment, most suited to his employment. An important responsibility of any forestry school, therefore, is to develop the individual so that his education will be most productive for himself and society. Hence a philosophy of forestry education in Oregon will be factored by this necessity of educating for the maximum self-development of the individual.

(2) The only hope for the people of a democratic state and nation is responsible citizenship. As stated in Chancellor Hunter's report

The welfare and progressive development of the state requires a citizenry familiar with and capable of understanding, at least the high points of the momentous problems of this post-war period. A well-developed capacity for good government in the state and local community can be assured only through a far-reaching and thorough policy of education for all citizens. A core of common knowledge based on the processes of American living for all levels of education is the essential foundation for such a state policy. In a democracy such an educational core is unique in its relation to the perpetuation of the ideals of free society and the form of government indispensable to freedom.⁶

Foresters should be as politically competent as they are technically proficient. Effective participation in his democratic society is more important to a forester than skill in professional techniques, and a philosophy of forestry education in Oregon will be factored by the necessity of developing the individual as a competent member of society.

(3) One of the industries served by Oregon State College is the forest industry. The management, the harvesting, and the fabrication of forest products are great enterprises and pose great problems in this state. A greater proportion of the basic economy derives from forest use in Oregon than in any of the remaining 47 states. For these reasons, the efficient management of Oregon's forest resource is of paramount importance to the welfare of every citizen in the state. Management will be effective only if the forest managers are effective, and they can be so, only to the extent that their education enables

The over-all philosophy of the School of Forestry as restated from these general premises is to aid the self-development of the student (1) as an individual, (2) as a citizen, and (3) as a technician in a professional field.

These are the ends. The means for their attainment lie in an integrated

⁶Hunter, *loc. cit*

program of personnel work and instruction. No matter how excellent the course materials, they will not advance forest management unless the men to whom they are taught are also rendered personally competent to advance forest management.

The student who is ill-adjusted to forestry should be discovered as early as possible and aided in making whatever readjustments are necessary. Analyses of individual needs, interests, and potentialities and the optimum development of potentialities are logically the responsibility of an effective personnel program. There is a constantly increasing complexity in forestry personnel relationships as the profession expands, as more men are employed, and as the lives of more and more people are daily affected by the work of the forester. This fact requires increasing attention to the personal development of the forester as well as to his technical development. He can fail if either phase of his total education be neglected. Personnel work and instruction are facets of a well-rounded education. They are complementary, not mutually exclusive. They are arbitrarily separated in the discussion which follows, solely for convenience. Because the forester as an individual determines the fate of the forest as a technician, personnel phases of a proposed forest management education are dealt with first.

A careful analysis of the curriculum proposed in later chapters will reveal that it does not completely fulfill the requirements in general education set up in this chapter. The prescriptive professional requirements and the desirability of providing for some electives to meet individual needs combine to prevent crowding additional courses in general education into a four-year curriculum. Some additional courses which aim at giving the student a broad background in human relations and human understanding would be desirable. Current conditions, however, do not warrant such additions. In practice, the lack of additional course work in general education is being offset somewhat by the harmonious contacts between students and staff. The staff members use their own manner of conduct in a conscious endeavor to develop the student's skill in human relations. Where personnel work is handled by men of integrity the results will be very beneficial.

Part II. The Personnel Phases of Education in Forest Management

Chapter 5

A PROPOSED PERSONNEL PROGRAM

THE NEED

A forestry graduate today is as much concerned with the administration of men as with the administration of the timber resource. Yet schools of forestry have consistently ignored this important phase of a man's professional career and have failed to develop his administrative potential. The Chief Forester of the United States says in this connection:

Administrative and executive ability are necessary for many positions. The forester's work in such positions is extremely practical and is concerned either directly or indirectly with the practical business administration of forest property. When he has advanced beyond an assistantship, he has charge of men and consequently must possess the ability to lead and direct.¹

The traditional course work offered in forestry schools is barren of materials which will develop the ability to lead and direct.

This is the considered opinion of men who know forestry and foresters. It is based on personal interviews with more than two hundred foresters in the Pacific Northwest. As a result of this opinion, and in collaboration with the men who offered it, a personnel program was worked out in an effort to overcome the deficiencies of past practice. The effective operation of such a personnel system will be time-consuming. But without effective complementary personnel work, course training can be of little value in the preparation of a forester.

The usual course procedures are not intended to develop personal capacities; yet these are inevitably conditioned by the college environment. Albert W. Hull of the General Electric research laboratory states: "Character and attitudes actually are molded by college influences, for better or worse, and therefore are products of college just as much as scholarship."² They should be the products of planned college procedures; procedures designed to promote the greatest possible self-development of character, social attitude, and ability to lead and administer.

¹U. S. Department of Agriculture, *Careers in Forestry*, op. cit., p. 6

²Albert W. Hull, "Selection and Training of Students for Industrial Research," *Science*, C1 (February 16, 1945, 2616), p. 160

What is required is an analysis of each individual student, giving careful attention to any demonstrated deficiency or potential promise he may have. The student should receive personal assistance in overcoming his handicaps and should be aided in exploiting his abilities.

The lack of personal development of forestry graduates inhibits their success and reflects adversely upon their college education. To maintain the high esteem in which it is held, forestry education at Oregon State College must continuously maintain and improve its standards. One of the greatest needs at the present time is improvement in the personal development of its students, as indicated from the survey of opinions held by graduate foresters.

It is not argued that foresters should receive special privileges above those accorded other groups of students. It is contended that personnel work is an inseparable phase of a well-rounded forestry education and should be considered as much a part of the academic program as surveying or silviculture. There are specific reasons why this is so

(1) Forestry is a career of service, a fact which must be made plain to all potential foresters. The United States Forest Service says:

In public forestry the spirit of service is a most important requisite for success. It is the spirit that causes men to place the interests of society and of the group at large above the interests of one's self or of the few. The Forest Service is proud of the spirit of public service that pervades its membership. In employing new personnel it seeks to obtain men and women who are not only properly trained for the work but have high ideals and a strong desire to serve the public.*

The inculcation of a spirit of service is a function not denied, but difficult to accomplish, in the impersonal atmosphere of a crowded classroom. It is more likely to be brought to fruition in a young man through close contact with an older man of high ideals. The conferences of the personnel system in the School of Forestry should provide this contact. Young foresters must be self-reliant and self-responsible to a greater degree than is asked of the average college graduate, for they may begin their careers in remote places without supervision. The development of these qualities cannot be delegated to incidental off-shoots of course work, it must be the result of a planned, continuous, vigilant personnel system.

(2) As a service to the student, to the college, and to the state as a whole, the would-be forester requires careful analysis; the potential forester should be separated from the probable romanticist, and the non-forester should be diverted into a field where he would have a better chance of success.

*U S Department of Agriculture, *Careers in Forestry*, op cit, p 7

(3) Additional personnel work is imposed by the many students who transfer from nonforestry schools. They have irregular programs; they are unfamiliar with Northwest forest conditions; they lack local business and social contacts; and considerable effort is required to orient them effectively.

(4) Representatives of the State Forester's office, of the United States Forest Service, and of the forest industry come to the School of Forestry each year to interview men for seasonal and permanent work. These employers expect the School to make accurate personal analyses of students. As forestry becomes more complex the assignment of men to the most appropriate positions becomes an increasingly difficult task.

These reasons justify consideration of personnel work in forestry as something more than a casual adjunct to instructional duties. This is the point of view of a leader in the field.

The School of Forestry should assign one man full time to personnel. Course work cannot be the sole concern of the School. Personnel work is just as important; it is an integral part of the preparation of a forester. The School would greatly benefit its graduates if at least one quarter of the technical forestry materials were to be supplanted by materials for personal development.⁴

The School of Forestry cannot carry on personnel work superficially, failing in its obligation to the students and to the profession; it must provide the adequate personnel work to complement the instructional program.

The responsibility of the school to the student was stated clearly several decades ago by B. E. Fernow, an early leader in forestry, and then in charge of a forestry school. He said.

Like any other modern institution of learning the forest school is not only to impart information and develop technical ability and judgment, making the mind a useful tool, but indirectly at least it must encourage the development of the heart and soul and produce a realization of civic duty and responsibility among its students so that from its ranks will arise apostles of right thinking and correct public attitude—desirable citizens. For *such* result, schooling as a whole is or ought to be responsible. But I insist that the public responsibility of the forest school begins and ends with its students.⁵

To discharge this responsibility adequately an effective personnel program is required; not as a separate procedure separated from the course work, but integral with it.

The specific objectives of the School of Forestry personnel program at Oregon State College are.

- (1) to analyze the personal and scholastic qualifications of every incoming student;

⁴Letter from A. W. Blackerby, Personnel Chief, United States Department of Agriculture, Alaska Region, December, 1945.

⁵B. E. Fernow, "Public Responsibility of the Forest School," *Forestry Quarterly*, VIII (March, 1910), pp. 29-30.

- (2) to discriminate between potential foresters and probable non-foresters insofar as is possible,
- (3) to aid the non-foresters in making adjustments to other fields; and
- (4) to aid the foresters in attaining the highest possible level of personal, civic, and professional achievement within their own limitations, by assisting students in personal adjustments, by encouraging good citizenship, and by implementing the formal instructional program.

Fulfillment of curriculum requirements is generally considered the norm for a professional forestry career, but the potential forester requires more preparation than unalloyed curriculum procedures. To achieve success in his field (1) He requires information and advice so that he can discriminate between values and weigh the wisdom of his choice. This calls for orientation. (2) He requires the highest possible development of his innate capacities so that he can overcome the adversities encountered in his profession. This calls for individual attention and guidance in self-development. (3) He requires the facility gained in field experience prior to graduation, to meet professional competition effectively; and he needs guidance in selection and maintenance of permanent employment. This calls for planned and supervised on-the-job training of undergraduates, employment service for the graduate, and a follow-up program.

These three requirements (1) orientation, (2) personal guidance, and (3) professional guidance are the three major facets of the personnel program in the School of Forestry at Oregon State College. Administration of the program is discussed below, followed by analyses of orientation, personal guidance, and professional guidance.

ADMINISTRATIVE PROCEDURES

As a basis for current administrative procedures, past practice was examined and specific efforts were made to overcome its faults. In 1942 a staff committee reviewed such personnel procedures as had been employed by the School of Forestry up to and including that year.⁶

Subsequent to the 1942 survey, a program was tentatively proposed to eliminate some of the more obvious deficiencies. Because of World War II, the changes were not effected. With a return to a more nearly normal instructional program in 1946, a preliminary revision of the personnel program

⁶W F McCulloch, G H Schroeder, and H J Vaux, "Personnel Work in the School of Forestry," (Corvallis School of Forestry, Oregon State College, June, 1942) (Unpublished report)

was undertaken. The findings of the 1942 survey, used as a point of departure for 1946 proposals, were:

- (1) The School had failed to make vital to the students such personnel procedures as then existed

- (2) The student did not receive enough counsel.

- (3) There was no follow-up, as shown by discovery of maladjusted men, ill-advised programs, and remediable deficiencies still persisting into the junior and senior years without effective efforts to eliminate the causes, there was a lack of information in the records to indicate that such conditions were appreciated prior to the junior or senior year.

- (4) There was lack of coordination between staff members in a continuous program of student development.

In 1944-45 Oregon State College began to give some recognition to personnel work. This enabled the School of Forestry to resume planning the reforms which should have been instituted in 1942. Specific reference is made below to the four chief defects found in the School program in 1942, and it is shown that the proposed program should eliminate them.

- (1) In 1942, staff members did not function effectively in personnel work because neither School nor College educated them in this phase of their responsibilities. In 1944, the College appointed a personnel coordinator to give impetus to personnel work over the whole campus. Taking advantage of this opportunity, the School of Forestry should be able to initiate a specific program of staff education in personnel procedures. Research in personnel work should be carried on continuously by the head counselor in order to provide effective materials for staff use. The results of such research, and close supervision of their application, should make the personnel program vital to the student.

- (2) In 1942 the student did not receive sufficient counsel because staff members were overworked and received no work load credit for personnel work. In 1946 the School of Forestry began to credit staff members for time spent in personnel activities. It should allocate not less than 10 per cent of each staff man's time to personnel work and not less than 50 per cent of the head counselor's time.⁷ The obligations of a professional forestry school cannot

⁷This allocation was made in the fall of 1947. It should be explained that this time allotment does not conclude the faculty member's participation in personnel endeavor. The situation in the School of Forestry at Oregon State College is perhaps unique, for the instructors consider class work part of the larger process of personal development of men. Thus they are engaged in personnel work continuously, not just 10 per cent of the time. The time allocation is for such specific purposes as keeping records, remedial work, and follow-up of individual problem cases. In the School of Forestry program the instructors now live with their men on the job through many 1- to 10-day field trips. (In 1947, 52 such trips were scheduled.) Under these conditions, as much may be accomplished by persistent adherence to personnel principles, as in institutions where students are formally assigned to a tutor and contacts are limited to the campus.

be discharged adequately with any less provision for personnel work. This would be a very considerable gain over 1942 and should result in more competent counseling.

(3) In 1942, there was no follow-up of men because adequate records and a record system were lacking. In 1947 efforts were made to obtain comprehensive information on each student by using a specific forestry personnel record of all information germane to effective counseling. It included an employment record on the student prior to his entering college, a seasonal work record while in college; results of college placement aptitude tests and Strong's vocational interest test; and a forestry aptitude test.

Each term a cumulative statement of the adviser-student conferences is now recorded in the personnel file. This practice is particularly valuable in maintaining continuity of guidance throughout the student's college career. After he graduates, a personnel report is requested from his employers at intervals for ten years following his graduation. This series of forms⁸ assures coverage of the essential phases of guidance and permits administrative control of the program. The various forms may be quickly reviewed by the Dean, and the presence or absence of essential information in the student's folder gives evidence of the adviser's exercise of responsibility in this assignment.

Specific phases of the proposed program are

HEAD COUNSELOR Authority in effectuating the personnel program should be delegated from the Dean to the head counselor, whose duties should include coordination of guidance functions; personnel research; analysis of students; adjustment of load to capacity; counsel of probationers and students failing at mid-term; referral of students to deans, to the Guidance Center, clinics, or other head counselors; representation of the School at Academic Deficiencies Committee and Head Counselors' Committee meetings; staff in-service training in personnel; industrial job-training supervision; seasonal employment supervision; maintenance of contacts with employers and graduates; analyses of the changing requirements of industry and profession so that school graduates will fulfill these requirements competently; and follow-up of graduates.

IN-SERVICE TRAINING The success of any guidance activity depends upon the effectiveness of the men doing the guiding. The head counselor should constantly supervise and evaluate results of the guidance work in an effort to improve service to the student. Information from agencies and em-

⁸Copies of the forms in use are found in the Appendix

ployers which will affect the personal guidance efforts of the staff advisers should be collected and made available for their use.

The objectives of personnel work can be attained only through the whole-hearted cooperation of staff members; if staff advisers feel the head counselor is imposing on them *his* program, cooperation is likely to be negligible. Instead, competent personnel work must be brought about as a joint venture in which all have an equal interest and responsibility. This fact must be paramount in all procedures aimed at improvement of personnel methods.

STUDENT ADVISEMENT. Students should be assigned, so far as possible, to the staff advisers who are most appropriate in view of the student's objectives. The mere assignment, however, does not automatically guarantee satisfactory results. It will be necessary for the head counselor to clear procedures with advisers, to check the records, and to provide information and assistance for the improvement of counseling where needed.

RATING THE STUDENTS. The measure of success of the school is the quality of performance of its students. The performance is likely to be most satisfactory where the man is well adapted to his job. This calls for student analysis in an attempt to fit the man to that job which will give him the greatest opportunity for exercise of his talents. This decision should be made upon the combined judgments of all the staff members who know the man. Students in the School of Forestry should be rated annually by the whole staff, meeting to judge the personal and professional competence of each student. The joint opinion should be entered on the student's record each year and along with all other personal material, made available to representatives of employing agencies who come to the School to interview prospective employees.

GOOD CITIZENSHIP. One of the most important tasks is to create in the student an attitude favoring good citizenship⁹. This will require support (but not domination) of student affairs, encouragement of student participation in extra-curricular activities for public service, not material gain; careful planning by staff members in every course to utilize all opportunities to develop good citizenship through precept and example. The student should be conscious of his place in the social order, conscious of the fact that in a democracy the social structure depends upon the citizen. Good citizenship should be implemented by the School, and it will be necessary to reorient any individual whose standards are not those of foresters.

⁹In actual practice, the Forestry Club and associated activities are used by the staff for development of students. Working closely with forestry student leaders, opportunity is created for citizenship training where most needed.

SENIOR ADVISERS It is not possible for all staff members to be completely informed at all times concerning local, seasonal employment conditions. This information may be of considerable value to the student who may be a prospective employee in a given locality or in a given type of work. The head counselor, therefore, should arrange for senior students to act as mentors for the freshmen, particularly with reference to local working conditions. The seniors are well able to arrange contacts for the younger men with seasonal employers, contacts which eventually may develop into permanent employment opportunities.

PERSONNEL COMMITTEE The continuous analysis of the personnel system, the critical review of aims and procedures, is essential if it is to succeed. A personnel committee including the head counselor should constantly appraise personnel work, maintain an orderly, progressive system, and strive to improve standards. One of the more important functions of the committee should be to review the position of students whose work is mediocre. All evidence for and against these students should be secured from the Guidance Center, from forestry staff members, and from other instructors. The committee will then be in a position to make intelligent recommendations for retention or suspension of forestry students being evaluated by the Academic Deficiencies Committee.

All personnel activities in the school must be coordinated so that uniform results will be secured. This requires analysis of the functioning of the program by the committee and recommendation to the Dean of any action needed to make it more effective.

Chapter 6

ORIENTATION

The general problems found in the orientation of college students are well stated in the following passage regarding the orientation of adult students.

There are those adults who know what they want, who often state quite positively exactly what they have in mind; who review and analyze with seeming verity their backgrounds, weaknesses, plans for correcting these weaknesses; and who, with assurance and often insistence embark upon a very ambitious program. On the other hand, many adults are utterly confused and pitifully vague as to what they have in mind, they feel that they should do "something," and underneath this feeling may be a situation or problem quite unrelated to anything that the school can hope to offer or correct. Many difficulties arise among adults when their interests and desires conflict with obvious inadequacies in ability and background. There is another group of adults whose interest span seems too brief, who drop out almost immediately, or change from group to group, but who cannot be dismissed as mere "floaters."¹

These classifications have also been found applicable to forestry freshmen, indicating the necessity for an orientation program to help resolve the uncertainties confronting the prospective forester. The orientation phase of the personnel program should be centered largely in two areas: in the College freshman-week program and in the School course in forestry orientation.²

FRESHMAN WEEK

Freshman week is an important and integral phase of the overall personnel program. As more and more students in high school reach for a college education, there are found to be increasing numbers appearing in college who are not "average students."

Intensive personnel work is needed to explore the best capacities of every student, to determine what is needed to permit him to adapt himself successfully to his environment, and to aid him in such adaptation. For all students this is the first contact with an academic career, and for many it may also be the first professional contact. The procedures of freshman week are significant because they initiate a student into a life work.

The purpose of freshman week is to make that life work fruitful by investigating (a) the student's interest in his chosen field and (b) his aptitude for success in it. In the School of Forestry, efforts should be made to

¹Paul E. Klein and Ruth E. Moffitt, *Counseling Techniques in Adult Education* (New York: McGraw Hill Book Company, Inc., 1946), p. 30.

²At all levels throughout the School program, stress is laid upon the integration of forestry with the social and economic order of the State. It is felt, therefore, that a student well oriented to forestry will be fairly well oriented to society.

analyze the personal and scholastic qualifications of every incoming student. Each prospective student should be examined to find out as accurately as possible what kind of man he is; what he is equipped to do best; or if he has no demonstrable capacities, or prior forestry experience, to attempt to determine whether or not he can profit from forestry education.

It is important to know, if possible, the student's greatest vocational interest. Strong's Vocational Interest Blank for men is suitable for this purpose. A least a preliminary test in forestry aptitude should also be employed. Results of these tests should be checked against accomplishments of men after graduation to determine the worth of the process. Gradually, the testing techniques could be refined until it should be possible to make a prognosis better than a guess that a given man would or would not make a forester. The proposed testing program is elaborated later in this monograph under the heading "Testing."

Test results alone cannot define precisely a man's potentiality for a successful career. That is a complex of numerous factors, many of which are impossible or difficult to measure. It is necessary, therefore, to supplement the test results with personal conferences. Each freshman should be assigned to a staff member who would serve as his personal counselor during freshman week. The forestry school personnel form should be used in these conferences to obtain the following information

(1) What reasons led the man to choose forestry? If the reasons are unsound, here is the place to correct any false impressions

(2) What acquaintance does he have with foresters and forestry? If a man knows nothing of forestry except camping or fishing, he may be a romanticist, but if he has worked for a competent forester, he is probably well oriented. Occasionally a man plans to enter forestry when his background would better qualify him for a related field. This should be discovered if possible, and the man should be diverted from forestry if his best interests seem to warrant the diversion

(3) What is his purpose in selecting his major field in forestry and what are the reasons for the choice? Many students are unaware of the possibilities and requirements in the three departments of the School, Forest Products, Forest Engineering, and Forest Management. While it is not necessary for the student to make his choice prior to the sophomore year, it is essential to give him basic information so that he may be able to make a reasoned choice. The adviser ought to be able to clear up any misunderstandings which might prejudice the student's chances for success in any of the options.

(4) Does the man possess any special capacities? In a professional school, the employability of the man is a prime consideration, and it is desirable to record any special skills which may aid in placing him in the most suitable employment

(5) Does the man exhibit any deficiencies? If so, what remedial action is necessary? A record of action taken and results achieved is essential in determining the necessity for more assistance

(6) Is the man a veteran? (a) What kind? Where did he serve? (b) What did he learn? Special training received in the armed forces may have civilian utility; (c) What disabilities does he have? (d) What rank did he hold when discharged? The man's rank, other things being equal, is some augur of his potentiality for leadership. It is also pertinent in determining the credits allowed for military training.

(7) Employment record before entering college. The kind of employment engaged in prior to college sometimes indicates a man's interest. Another reason for this query is that the employer should be asked to furnish the School a personnel report on the man.

In summary, the Freshman Week adviser should weigh the answers to the above inquiries, survey his personal impressions of the man, and evaluate such test scores as are available. On the basis of past experiences with comparable data, he should be able to make an estimate as to the student's potentiality for success or failure in forestry. This would be an estimate only, subject to revision upon receipt of more definitive data. Except where the likelihood of failure is most obvious, no candidate for a forestry career should be told that he will not succeed. Instead, all the facts should be laid before him so that he can make his own choice, aided by the mature judgment and experience of the adviser.

It does not follow that a man cannot succeed in other fields if he appears to be ill-adapted to forestry. For this reason, a close contact should be maintained between the head counselor in forestry and in other schools on the campus. During Freshman Week (as throughout the year) students apparently maladjusted to forestry should be referred to the Guidance Center for analysis and then to the appropriate counselors. Interviews with these counselors may show some students their real, but unappreciated objectives; and men may be reoriented who would have dropped college thinking that forestry had nothing to offer them.

"Freshman Week is an opportunity to establish a relationship with the students which will inspire their confidence in the faculty and the school."³

³Paul M. Dunn, *Administrative Manual* (Corvallis School of Forestry, Oregon State College, 1945), p. 17 (mimeographed).

This fact should be exploited during Freshman Week in order to give the new man a feeling of security in new surroundings. To this end special efforts ought to be made to acquaint him with staff members and their responsibilities, with the School and its facilities, with the Forestry Club and its traditions, and with the School properties and their role in the academic program.

The exposition of School functions should be a further contribution to the prospective student's information about forestry and should help him to make a fairly reasoned choice of a career. Those who elect to become foresters should receive two further services during Freshman Week (1) each man should be assisted in working out an academic program adjusted to his individual needs and capacities, and (2) each man should be embarked upon a personnel program to continue throughout his college career and after he graduates. The objective of this program should be to aid him in attaining the highest possible level of self-development in personal, civic, and professional life.

ORIENTATION COURSE

As is the case with the Freshman Week program, the work in orientation should be an integral part of the personnel program of the School of Forestry.

A primary purpose of forestry orientation should be to eliminate a classic misunderstanding which has done a great disservice to many young foresters. The profession of forestry is haunted by a colonial legend. Though the frontier era has passed, its traditions persist and its mores are still deeply ingrained in American youth today. Many boys hope to recapture the rollicking adventure and excitement of pioneer days by becoming foresters; but forestry today is a serious, exacting business enterprise. It is the task of orientation to make this fact clearly understood. It should also give the student unbiased data concerning forestry upon which to base sound career decisions. Foresters and others associated with the profession should be asked to address the class in order to provide information on problems and progress in different branches of forestry. Such talks furnish an opportunity for employers to explain their employment needs, and the responsibilities of foresters as they apply in various branches of the profession. Outside speakers also provide a much wider coverage of the field than would be possible in conference between student and staff adviser.

Orientation lectures should parallel and integrate the addresses of outside speakers, showing the relationship between the forestry careers discussed and the personal development of students. In forestry, the ability to work

successfully with people is requisite to success. Recognizing this fact, emphasis should be laid upon the personal adaptation of the freshman to the profession of forestry.

To achieve success as a professional forester a man must possess personal characteristics which earn the respect and good will of his fellow man, be a good student; and be a good workman. Orientation should attempt to aid self-development in each of these three areas.

PERSONAL DEVELOPMENT. Since the forester in America must first be a citizen in a democratic community, a primary concern should be an analysis of the democratic way of life, of the privileges and obligations of foresters working within a democratic pattern.

ABLE SCHOLARSHIP. The second major division should concern the student's responsibility to make something of himself scholastically. The basic considerations ought to be (1) four years of forestry credits do not make a forester; (2) commencement day is the commencement, not the termination of education, (3) the forestry school merely provides and sharpens tools with which the forester must work out his own education *after he leaves school*, (4) the purpose of all education is to enable the student to live a richer, fuller, more abundant life; and (5) since the competition in forestry is keen, the man who makes a failure of his forestry work during college can scarcely hope to make a success of his forestry work afterward. The worth of that work will depend largely upon the degree to which the student prepares himself in college—the better the tools, the better the career that can be built with them.

PROFESSIONAL COMPETENCE. The third major division of the orientation course should be a consideration of professional attributes. The growing, harvesting, and manufacturing of forest products are not three separate processes, but different phases of the one process, utilizing the productive capacity of forest land. The same mental ability is required for solving problems in each field, and the attributes essential to success in one, are essential to success in all of them.

Consideration of personal attributes is a background for the study of professional competence, and should be one of the most important concerns of the whole personnel program of the School. In the orientation course specific application should be made to the problems involved in obtaining and keeping a job.

A personnel procedure which should be employed in conjunction with the personnel course is the self-analysis of the student. After the course has progressed far enough to enable the student to appreciate its objectives, each

man in the class should be asked to submit to the instructor a confidential analysis of the student's own deficiencies.

In three years of experience with this personnel device at Oregon State College, it was found to be one of the most valuable procedures employed. Given a week in which to ponder the problem, most men will make an honest analysis which elicits information that might never be offered otherwise. Frequently the students reveal personal deficiencies inappreciable in casual classroom contact, or not admitted in conference. Careful appraisal of each analysis affords a basis not only for better orientation of the student, but for elimination of personal difficulties which might bar him from success, no matter how well oriented.⁴

⁴In an attempt to define the aptitudes of foresters, the self-analyses are being retained with the intention of relating the personal qualifications to later professional performance. After reviewing many of the answers, it becomes evident that patterns of thinking characterize many men. If certain patterns revealed by the answers consistently characterize successful men, and if other patterns consistently characterize those who fail, it is possible that eventually some aid to prognosis of success or failure may be developed.

Chapter 7

PERSONAL GUIDANCE

Among foresters there is no question of the need for thorough personal guidance. This opinion was voiced recently by a symposium of American forestry graduates on the staff of the Army's Biarritz American University in France. Their statement was.

Of primary importance is a thorough and sincere counseling service. Freshmen, who know only in general that forestry holds an appeal for them, should have courses suggested which best meet their capabilities and aptitudes. Counseling becomes increasingly important in the following years when decisions must be made in selecting the brand of forestry to be followed. Improved instructor-student relationships through smaller classes go hand in hand with a good counseling program.¹

Complementary phases of personal guidance should be, first, the gathering of information upon which to base decisions, and second, analysis and use of the information for student benefit.

TESTS

The testing phase of the personnel program should have two objectives (1) to determine as accurately as possible the student's interest in and aptitude for, a given type of career; and (2) to discover personal weaknesses or scholastic deficiencies which might block attainment of his goal. This latter phase of testing is intimately related to curricular procedures. High scholastic achievement is difficult for a student handicapped by inadequate high school preparation, or by physical disabilities. There is a natural reluctance on the part of students to admit deficiencies, and they frequently accept the penalties of such handicaps rather than volunteer information concerning them. This circumstance gives a major purpose to the testing program: it should objectively elicit information concerning those factors which are inimical to the success of the student.

In addition to the standard college placement tests in general education fields, the School of Forestry should use a vocational interest test and a forestry aptitude test. There are no established aptitude tests in forestry, but it is proposed to attempt one, and to keep records of the test results for at least twenty years. At the end of that time, something definitive may be learned by correlating the test records of men with their accomplishments after graduation. In a sufficiently large sampling it might be possible eventually to establish criteria which, if applied to freshmen, would provide reasonably accurate

¹Walter T. Bagley and others, "Where do our Forestry Schools Fail," *Journal of Forestry*, XLV (March 1946), p. 174

prognoses of the men. The competition in forestry is keen, and it is extremely important that only those men with a strong predilection for success in the field be encouraged to continue in it. Men should not be indifferently carried along until graduation if they are ill-adapted to their choice of career physically, mentally, or socially.

Physical disability is generally appreciable, and it should not be difficult to dissuade a man from entering a field where a known disability constitutes a vocational handicap. It is more difficult to detect a mental indisposition for a specific vocation. There are as yet few satisfactory criteria for determining the non-physical reactions of men toward given occupations. The reasons why men lack the prerequisites for success in a given vocation are obscure. Often they cannot be identified with certainty, but an attempt must be made to discover them.

INTEREST TESTING. A well-known interest test which includes references to forestry is Strong's Vocational Interest Blank for Men. This test produces a rating represented by a single number. It is a simple matter to compare these numbers and to determine comparisons and degrees of interest.

Dr. Strong has worked upon the interests of civil service foresters for several years and has accumulated authoritative information on this subject. He finds " . . . that promotions on the average, go to men with lower interest scores in mechanical pursuits and higher scores in general administrative interest."² This observation is further substantiated by his discovery that of the top-ranking administrators in the Forest Service, only 38 per cent exhibited a high interest in forestry as such while 100 per cent of these men successful in forestry evidenced a high interest in public administration. In other words, competence in personnel relationships appears to be a greater requisite to success in the Forest Service than merely a capacity to cope with the technical factors of the forest.

The fallacy in employing men with the interests of scientists for typical forestry positions is stated by a forest service administrator whom Strong cites as follows:

It explodes the old fiction that Forest Service men are scientists. True, some of us have had a little scientific training and some perhaps is a good thing, but we attempt to recruit scientists as rangers. Those we get go in one of three directions: some quit, some get transferred to research work, and some become frustrated and are no good to themselves or the service.³

The usual forestry school procedure stresses acquisition of factual material, and the development of the skilled technician is the dominant theme.

²Strong, *op cit*, p. 161

³*Ibid*, p. 162

The reason for this is that employers in the past have looked first for immediate job-competence; and civil service forestry examinations in the past have tested chiefly the candidate's knowledge of things rather than his capacity to deal with people. The important task of developing administrators is left wholly to chance in most forestry schools and the one-sided emphasis is likely to produce one-sided men. The natural consequence of forestry education based on material things is the graduation of men similarly limited. Strong's data suggest that.

. . . in the Forest Service the interests of district rangers and administrators differ so appreciably that it is questionable whether many of the former will or should be promoted to management. And it is furthermore questionable whether there are enough men in the lower brackets with the interest of administrators to supply the service with properly qualified men at the top.⁴

This excellent analysis of the interests of Forest Service employees does not apply with equal validity to some other types of forestry employment. A particular disadvantage for its use in a school of forestry located in a predominantly industrial forestry area, is that it does not examine the interests of industrial foresters. It is true that for many years the interests of Forest Service employees were the interests of substantially all foresters; there were few industrial foresters and there was little need for sampling their interests. Today the situation has changed appreciably, and industrial forestry in recent years has employed as many foresters as the Forest Service.

To determine the interests of men working in the forest industry, it is necessary to extend the range of Strong's test. This was undertaken by the writer with the support of Dr. Strong. Based on records of accomplishment and professional reputation, one hundred outstanding industrial foresters in the Pacific Northwest were asked to complete Strong's Vocational Interest Blank. The responses were then treated in two ways, first, they were evaluated by the standard Forest Service criterion, with results in general showing departure from the answers of Forest Service personnel; second, each of the 40,000 individual responses were evaluated to determine the industrial forester's interests. From this analysis by Dr. Strong, a calibration was developed for the specific interests of industrial foresters.

This is the only known criterion for measuring the industrial interests of foresters. It indicates sufficient basic differences between the interests of civil service foresters and of industrial foresters to warrant rating freshmen in both fields. Because of these differences, some distinctions appear to be warranted in the curricular procedures for the two fields.

⁴*Ibid.*, p. 157.

APTITUDE TESTING: Forestry has been neglected in the rapidly burgeoning field of aptitude testing for a variety of reasons. It is a relatively young profession and has not matured into consistent patterns for which aptitudes may be measured readily, the total employment in forestry is limited, and does not offer attractive prospects to the professional testing agencies; finally, few foresters themselves are interested in testing, the general belief being that tests of general aptitude will serve equally well for forestry aptitude.

This belief is warranted only insofar as it is true that aptitude for general achievement and for forestry achievement run parallel. If there is a divergence in the requirements for success in forestry, and if the diverging factors are measurable, there is justification for a forestry aptitude test.

The fundamental scholastic requisites for success in forestry as in similar professions are proficiency in mathematics and effective use of oral and written English. These capacities are specific, many tests for them are available, and a man's aptitude in them may be established fairly readily.

There remain other capacities which warrant special consideration in forestry; certain facets of forestry employment require qualities not germane to some other occupations. If these differences may be identified, and tested for, it should be possible to establish at least an indicative forestry aptitude examination. By combining tests for the factors peculiar to forestry with the best tests for those aptitudes which forestry holds in common with other professions, an overall forestry aptitude test might be developed.

Numbers of foresters have expressed their opinions on the personal aptitudes which were requisite for success in forestry. The list below is a compilation from 12 different sources, representing a cross-section of opinion from some of the outstanding leaders of forestry in America, Gifford Pinchot, Lyle F. Watts, Evan Kelley, Shirley Allen, Henry S. Graves, Cedric H. Guise, among others. This record is not necessarily entirely inclusive, nor is it exclusive to the field of forestry. It does indicate the qualities which successful foresters believe should be the attributes of a potential forester if he hopes to achieve success in the field. There is some duplication, and some slight distinctions probably do not warrant separation into more than one category; but the original terminology has been preserved in order to present all shades of meanings. The numbers in parentheses following each item indicate the number of times it was mentioned by the 12 authorities.

1, Ability to work well with others (10); 2, have a spirit of public service or, possess high ideals in managing the resource for the benefit of all (10); 3, administrative and executive ability (9); leadership (9); 4, strong

rugged constitution (9); 5, intelligence (8); 6, personal interest in the problems of forestry and a willingness to make sacrifices for the betterment of the profession (7); 7, good personality (7); 8, initiative (6); 9, effective management of men, or foremanship (5); 10, resourcefulness (5); 11, character (5); 12, honesty (5); 13, vision (5); 14, willingness to endure hardship (5); 15, courage (4); 16, keen powers of observation (4); 17, sense of responsibility (3); 18, enthusiasm (3); 19, tolerance (2); 20, discrimination (2); 21, self-reliance (2); 22, adaptability (2); 23, loyalty (2); 24, faith in the work (2); 25, take criticism well (2); 26, mechanical ability (2); 27, common sense; 28, love of outdoors; 29, perseverance, 30, sincerity, 31, sportsmanship; 32, courage to work for the realization of ideals, 33, industry; 34, thoroughness in details; 35, earn the respect of tough woodsmen, 36, be able to follow a plan to its successful conclusion.

The need for executive talent is especially important in forestry because of the vast increase in complexity of forest operations in recent years.

Forty years ago the forest ranger was a lonely man, plodding the forest trail. Today:

The district ranger must be (1) a line executive concerned with administrative management, i.e., planning, organizing, directing, supervising, inspecting, training, and employee relations—and in this field he must know how to deal effectively with people; and (2) a technical officer competent wisely to manage land resources in timber, grazing, recreation, water, and similar resources. On the smaller districts, he may be predominantly a doer; on the larger ones predominantly an administrative manager. On every district he must be competent in both the administrative management and technical fields⁵

Forty years ago the lumberman was simply a man who turned trees into boards. Today he is an industrial forester, concerned with all the complicated ramifications of an enterprise which is at once social, biological, and industrial. His task now is to turn as much of the tree as possible into the myriad of products which wood technology has made possible; and to do it so that social as well as economic benefits will accrue to the operation. This calls for executive or administrative talents of a high order. Efforts should be made to try to discover presence or absence of administrative aptitude in prospective foresters; and where the talent is susceptible of development, it should be developed through the personnel program.

Intelligence has not been discussed among the characteristics which might be looked for in an aptitude test. As in every other field of endeavor, a high level of intellectual capacity is a valuable attribute of the forester, but this may be determined by a wide range of specific intelligence tests and is not a phase of specific forestry aptitude testing.

⁵U S Forest Service, *op cit*, p 5

Among the desirable qualifications which were mentioned less than four times by the twelve authorities, mechanical ability is perhaps the only other aptitude which could be tested readily. A large number of different types of mechanical aptitude tests are available and could be used for the testing of prospective foresters.

To summarize the broader aspects of forestry aptitude, it includes (1) consideration of intelligence, of the basic tools of English and mathematics, and of mechanical aptitude, for all of which tests are available, (2) consideration of such intangible qualifications as executive capacity, for which tests are either lacking or not wholly satisfactory, (3) consideration of a rugged constitution, which may be determined more or less accurately; and (4) these remaining major qualifications listed by the twelve authorities, ability to work well with others, spirit of public service in resource management, leadership and administrative ability, initiative, resourcefulness, and keen powers of observation.

It is felt that a man's capacities in these latter qualifications might be discovered through appropriate aptitude tests. It is proposed to break down each qualification so far as possible into identifiable components, then to set up situations (preferably with reference to standard forestry activities) requiring answers which will indicate as nearly as possible the man's possession, or lack, of the factor being tested for. Preliminary phases of such a test have been worked out and will be tried out on a representative group of graduate foresters. Results will be checked against achievement of these men in the profession. Phases of the test which show a consistently low correlation with accomplishment will be eliminated, and it is hoped that a progressively more accurate test may thus be developed. When some degree of stability has been attained, the same test will be given to forestry freshmen. The results should be recorded for at least 20 years. The aptitude test should be checked continuously against other known indices such as the grade point average, the College placement score, and the ratings obtained in civil service and other examinations. By constant revision it is hoped gradually to refine the procedures until a reasonably accurate prognosis may be made of the candidate's aptitude for a career in forestry.

The results of aptitude tests should be employed only as one indicator, not as the sole determinant of the student's career. There are certain fundamental aspects of human life that will never lend themselves to screening through aptitude tests. It is possible that such aspects as honesty and loyalty, for example, may more significantly affect the student's success than the qualities which are susceptible of testing.

It is proposed that aptitude testing in the School of Forestry be employed, not as a basis for rendering pseudo-omniscient counsel, but only as one more device to aid in rendering the student the greatest possible service.

CONFERENCE

The conference should be the heart of the personnel program. It gives the good teacher a chance to reach the student as he never can be reached in class. Its objective should be to implement all the formal purposes of the school through friendly, informal discussion and personal application.

Having attempted to determine a man's needs and abilities through the testing program, the next step is to counsel him in undertaking whatever measures are necessary to requite the needs and exploit the capacities. The Academic Deficiencies Committee of Oregon State College is alarmed at the number of students whose main trouble is inadequate or improper advice. The Committee believes that a better check should be made on a student's preparatory background and ability as indicated by predictive test scores before assigning courses. Those students who have poor high school records and low test scores should be given special attention in conference, and their work throughout the term should be checked constantly. The persistent effort of all staff advisers, not alone the head counselor, is essential for this purpose. Greater gains in effective studying may be brought in conference than in classroom. It is useless to lecture to men who cannot profit from the lecturing because of handicaps which could have been detected and remedied through personal conference. In normal times not more than 30 students should be assigned to a staff adviser; this will permit him to spend an hour or more with each student each term.

General purposes of the conference include the following.

(1) The student should be made to feel that he belongs to the School and to the profession. Foresters in the field exhibit a considerable *esprit de corps* and the beginnings of this high morale should be nurtured in the School. A man must have faith in his work; forestry warrants that faith, and a sense of pride in the profession can be inculcated in conference.

(2) The student should be given a load commensurate with his intellectual capacity and outside demands on his time. Results of test scores are at least rough indicators of the student's capacity, and the adviser should be able to qualify this by the amount of effort diverted from study by work or other activity. It is necessary to follow the student's record carefully from term to term, this is facilitated by the use of Form F⁶ which provides on one

⁶See appendix

sheet a cumulative conference report for the student's four years. Recurrence of mid-term warnings or probation status should not be overlooked. In one study, 55 forestry students on probation had made a grade point average of 1.733 and only 7 of these men finally graduated.

(3) Students should be advised on particular problems which they encounter in specific courses. This should include analysis of general study conditions and techniques and orientation of the student to the objectives of individual courses. Student interest may often be aroused in a specific course when the relationship of that work to the whole curriculum is explained.

(4) Personal handicaps should be detected. In large classes it is not easy for the instructor to know all the students intimately. Deficiencies may go unnoticed in a group, but should be more easily identified in personal conference.

(5) Where necessary, the student should be re-oriented. Men whose capacities are not equal to the intellectual rigors of college study in forestry or in other schools should be counseled to terminate their programs rather than to attempt goals beyond their reach. It is possible for the adviser to show the values inherent in a partial college course. Conversely the very superior men need re-orientation of their efforts in productive directions if they find standard classroom procedures boring because these do not require exercise of their full capacities.

FRESHMAN YEAR In the freshman year, conference emphasis should be on aspects of good citizenship and general education. (This should be a continuing concern throughout the rest of the four years as well.) Since half or more of the freshmen will not become foresters, undue emphasis upon vocational guidance at this stage is no service to the group who will not become foresters. Attempts should be made to discover why the student came to the school; what he hopes to be, and how well he is fitted to attain that objective. The adviser should also try to determine if the student is in the right field; if he is able to profit by the program of the school; and if all the facilities of the school and college which he may need are being employed to his advantage. Students should be carefully checked to determine if they have any handicaps which would prevent the competent exercise of citizenship, even on a modest level. Attempts should be made to remedy these social defects. It is particularly essential to detect and remove, where possible, any bar to better scholarship. *Wherever handicaps are discovered which would prevent success in the professional field, arrangements should be made to remedy them.* If his academic or personal deficiencies are irremediable, the

student should be assisted in making a readjustment to another field where his particular handicaps will not be inimical to his success.

If the student's activities are out of register with his expressed ambition, responsible counseling will help to reconcile the differences or to make the necessary adjustments if they are irreconcilable. Mere attendance at a forestry school does not constitute adequate preparation for a professional career in forestry. Often this point of view is found to be novel to the student. In such case he is counseled to explore fully all aspects of his prospective employment, to determine the personal and technical qualifications required for success; to make preliminary contacts for seasonal employment so that he may obtain first-hand experience in his chosen field; to analyze the rewards, and their relationship to those available in competitive endeavor, in short, to make intelligent analyses to determine what is offered, and what is required, for successful accomplishment in the chosen career. The forthright thinking about a job induced here by careful counseling does much to dispel romantic illusions about forestry and helps to clarify objectives.

It is recognized, of course, that a growing mind is a changing mind, that education is a process of continuing readjustment, and that a goal which initially seems appropriate may shift with progressive orientation. Thus no attempt should be made to require the student to adhere to whatever objective he originally indicated, the important consideration is that he be set to thinking of objectives in general, rather than a specific type of work.

SOPHOMORE YEAR In the sophomore year, general education is still a concern, and effort ought to be made to remedy academic deficiencies uncorrected at the close of the freshman year. The student's potentialities for success in the various forestry options should be diligently analyzed, and he should be given detailed information on these aspects of the profession which most appeal to him. His attention should be directed toward materials which will give him an understanding of his proposed major.

Presumably the student will have secured employment between his freshman and sophomore years. A personnel report from the employer should be found in the student's folder covering his performance on the job. From information furnished by the employer, special capacities exhibited by the man should be encouraged, and self-development along those lines assisted; good work should be recognized; the student should be aided to overcome reported deficiencies; and he should be held strictly accountable for irresponsibility or incompetence. Any unusually bad reports should be referred to the head counselor for checking, in order to protect the student and the school against misunderstanding or prejudice.

The student should be counseled to diversify his summer employment. In many instances it would be preferable for him not to return to the same position which he held during the previous season if possible to secure other work. Experience in a wide variety of summer jobs is needed to prepare men for the adaptability which will be required of them in the diverse fields of permanent forestry employment.

If the student has no background in forestry other than his season of employment as a freshman, it might be well for him to remain out of college for a full year before beginning his specialization in the junior year. The man with a year of field work for background will be in a better position to profit from future course work. He will appreciate his deficiencies prior to graduation and will have an opportunity to remedy them before he leaves the college; his studies will be more valuable, more meaningful, because he will be able to make practical application from his own experience, finally, an added year toward maturity will give him additional poise, assurance, a faith in his own capacities which is almost wholly lacking in the inexperienced student who goes from high school directly through four years of college.

JUNIOR YEAR In the junior year, it may be assumed that the student is content with his choice of a career, and he should be aided toward self-development in that direction. In his enthusiasm for his special field he should not be permitted to neglect opportunities for continued general education. Preliminary steps should be taken to implement his ultimate specialization.

Careful diagnosis ought to be made of his on-job performance, and any needed remedial measures should be undertaken to correct defects in that performance. Possibilities for broadening his work experience should be considered, both to round out the student and to provide him with a personal knowledge of several fields which might offer possible careers. In the spring term of the junior year the student should be asked what employable talents he expects to offer to prospective employers a year later. If he is inadequately prepared, it is desirable that he be made to realize the defects now while there is still time to repair them with additional experience. Emphasis should be laid upon the fact that a diploma alone is not an infallible guarantor of success.

SENIOR YEAR In the senior year, the chief considerations which ought to be covered in conference are (a) curriculum, (b) personal development, and (c) future employment. These important facets of a student's college career may seem to be too important to be left to conference action for development. Such is the case. The conference should merely supplement and

codify other efforts toward curricular adjustment, personal development and future employment which ought to be made continuously in class, in general school activities, and in the field.

(a) The adviser should review the student's course record to see that all academic requirements for graduation will be fulfilled. In addition, any obvious gaps in adequate preparation for a particular field should be remedied.

(b) When a student reaches his fourth year in the School of Forestry, From these data and complementary personal acquaintance, the adviser should contain an appraisal of the man by his seasonal employers, a summary of staff opinion in previous years, and a cumulative record of past conferences From these data and complementary personel acquaintance, the adviser should have a fairly accurate picture of the student's attitude, aptitude, and personal idiosyncracies A final effort ought to be made to eliminate any characteristics which will limit the student's opportunity for success; and equal effort made to assist the man in developing special potentialities for success. A final summary and analysis should be made of the student as a man and as a technician, and this information should be entered on the personnel record

(c) The last consideration above is closely allied to another phase of senior conferences—employment The student made a general choice of a career when he entered college, and a specific choice in his sophomore and junior years. Now at the beginning of his senior year, he should analyze that specific choice critically, and make a belated change while there yet is time to do so, if it appears that earlier decisions were ill-advised. If the man is convinced that he is in the right field and if the facts bear him out, he should be encouraged to make preliminary contacts for eventual employment if he has not already done so. He should capitalize upon past field experience in planning for a future career. If he has been well-advised in earlier personal conferences, his field work should relate to his choice of career.

Chapter 8

PROFESSIONAL GUIDANCE

A professional school has obligations transcending education *per se*. In a sincere effort to teach well it is possible to lose sight of the purpose of teaching. The obvious goal of a School of Forestry is to produce competent foresters and to this end it must develop specialized skills and capacities. This is not enough; the traditional course materials are not all that any man needs in order to become a competent forester. The purposes of professional guidance in general are well stated as follows.

The function of guidance is recognized by all colleges, and advice and placement are considered part of their responsibility. By placement I mean finding the right kind of activity rather than getting a job. Few young men know what they want to do. They enter college with the question, "What have you?" [The function of] broad education is to show them what treasures of activity life holds; and to give them opportunity to try these different activities and find which ones give them satisfaction. The time is short and the range of subjects is long. A correct placement can be found in four years only with the help of sympathetic and alert guidance from teachers.¹

A forestry school must maintain a close relationship with the professional field, for if it graduates students who are ill-adapted to current practices in the industry, it fails in its obligations to the student, to the state, and to the industry it serves.

Forestry is changing rapidly at the present time, and it is essential to the development of competent graduates that campus education be closely integrated with field practices. This may be accomplished by supervision of the student's seasonal apprentice work, by offering employment services to employer and employee, and by following carefully the careers of graduates. Information and experience obtained from all three methods should be brought back to the campus for the continuous betterment of the school program.

SUPERVISED APPRENTICESHIP

The forestry schools should exploit to the greatest extent on-the-job training programs through summer employment in different branches of forestry. This requires active cooperation with federal, state, and private agencies. Training not only affords the student an opportunity to absorb a wealth of practical experience unobtainable in the classrooms, but also gives him the practical adaptation of technical material.²

¹Hull, *op cit*, pp 158-159

²Bagley, *op cit*, p 175

As a considered part of the personnel program, the School should send a letter to seasonal employers pointing out that the student is more than a workman, that he is an apprentice forester; that the future of forestry will ultimately depend on men like him, and that more than casual supervision of the man is requested. In addition to close supervision, the school should ask employers for as much training as may justifiably be given the student, and for an analytical report on the man at the end of the summer. This procedure will be especially helpful where it is not possible for a staff member to visit the student on the job.

Tead recognizes the necessity for close correlation of field work and class work, in the following quotation

when we grasp what an involvement of the total person the learning process truly is—then the integral role of field work at once begins to get recognition at its rightful worth. We are led increasingly to the view that book work is not enough, that some systematic contact of the student with the workaday life outside can be stimulating. . . . we will eventually acknowledge our responsibility for planned guidance of the supplementary activities of each student at least in the two or three months when he is typically not on the campus³

The development of the man and the job must go hand in hand; the job cannot be developed to its full potentialities unless the man is so developed. Hence the necessity for continuous supervision of students not only on the campus, but on the job.

In line with a general trend toward giving new men more thorough and complete on-the-job training, and forestry students certainly seem to fall within this group, it occurs to me that it would be possible and desirable to go further than has often been the case in systematic follow-up on summer assignments to assure that the maximum training benefit practicable is received. What I had in mind was the possibility that some [forestry faculty] training officers be assigned to follow up specifically on the assignment and training of short-season men. By this is meant that they would determine what kind and quality of experience the men were getting, attempt to improve the training being given by supervisory personnel, and perhaps conduct some group training directly⁴

An accepted requirement for graduation from the School of Forestry at Oregon State College is six months of practical experience. This is a vital necessity, both to increase the employability of the student, and to protect the College against the criticism of graduating men ignorant in their own fields. The average underclassman is in need of guidance on the job. Despite previous experience or course work he is still a beginner in need of counsel if he is to work most efficiently. The mechanics of seasonal forestry

³Ordway Tead, "Trends in Curriculum Building," *The Journal of Higher Education*, XVII (June, 1945), p. 289

⁴Letter from K. D. Davis, Dean, School of Forestry, Montana State University, Missoula, January, 1946

employment often prevent the provision of such counsel by the employer, and the School of Forestry must supply it. At least one staff man should be assigned to supervise summer work. Seasonal personnel reports on students sometimes fail to present all the pertinent facts, either for or against the man. So far as possible these data should be supplemented by on-the-spot reports made by a school staff member. Weaknesses in the student could be discovered and efforts could be made to eliminate them before they became fixed or became serious threats to employment. If a student is ill-suited to a particular type of seasonal work, he may be damned as incompetent if left on his own, but intelligent analysis of the situation by an experienced faculty member should result in transfer of the student to more appropriate employment, without a blot on his record.

Another reason for supervising seasonal employment is that the student frequently tends as a matter of least resistance to return to the same job which he held the previous summer. This lessens the training load of the employer, but it also lessens the experience of the employee, and in the long run redounds to the disadvantage of employers in general. The staff supervisor can appraise more accurately than the student, the worth of a given type of seasonal experience and should arrange for different work the next season if needed to diversify the man's background.

This supervision of summer work must be carefully handled. It is not intended to smooth the student's path, or to interfere in any way with the normal administrative procedures of the employing agencies. Limitation of time will prevent anything more than a sampling of student employment. This should be undertaken with the cooperation of the employer, in order to keep the school informed as to different job requirements and to student performance on those types of jobs.

From seasonal job supervision should come a first-hand knowledge of job requirements, of student performance, and of school competence. This information ought to be valuable in revising curricula and in improving the personnel program. State and federal forestry agencies have expressed a willingness to cooperate with Oregon State College, and through the Pacific Logging Congress industry is evincing a major concern with this program. Members of the Willamette Valley Lumbermen's Association arranged the supervised, industrial job-training of Oregon State College foresters beginning in the summer of 1946.

There is special need for supervised apprenticeship of students majoring in industrial forestry so that the industry may make more effective use of college graduates. In the past there has been little job training or seasonal

supervision of students in industry. Some of the resulting misunderstandings are:

(1) There has been little or no effort on the part of forestry schools to co-ordinate their programs with the needs or interests of industry.

(2) Many of the supervisory personnel in logging camps have had little contact with young technicians, and many of these young men have had an inadequate acquaintance with the men in the camps. It is also true that historically the logger looked with disdain upon college men.

(3) Inadequate attention has been given to on-the-job training and in many instances a new man has learned the techniques of the operation only through accident. Frequently there was no clear explanation of duties and responsibilities either to the new man *or* to the man with whom he was expected to work. As a result, a beginner, particularly with a college background, could be at odds with his fellow employees before he was fairly started on the job. The uneducated but highly skilled workman who takes pride in his job is likely to be contemptuous of any man who cannot do that job well. A staff member engaged in job-supervision should be able to see that students were given a fair opportunity, that they were not placed in positions where they would be ridiculed because they were ignorant of techniques which they never had had a chance to learn.

(4) Unfortunately there are instances in which a "forester" has apparently been hired as a front so that the company could say that it had a forester on the payroll.

(5) At times the young logger or forester was not given enough authority to do even routine things well; at other times he was given too much authority before he had gained sufficient maturity or experience to handle the responsibility. Analysis of these situations by a staff supervisor of seasonal work should resolve the difficulties.

To improve industrial job-training a specific training program should be worked out by each company in collaboration with the forestry staff member assigned to supervise summer work⁵. Student trainees should be provided with working conditions and opportunities equal to those of other employees. Too often the student goes out on a summer job, remains there simply as a name on the pay sheet, and has no chance to learn anything more than the routines of his particular work. This will not increase his value to the employer. Young foresters should be transferred from job to job wherever this can be done without undue loss of production or unreasonable costs to

⁵Such collaboration has now been effected between the School of Forestry at Oregon State College and four of the largest industrial forestry operations in the State.

the operator. The changes should not be haphazard, but should provide the beginner with the widest possible knowledge of the operation. This broad training will be advantageous to all concerned. Certainly the company will know whether or not a graduate will be a desirable employee if he has been on the pay roll for several seasons as a student, and certainly the student will know whether or not the company offers opportunity for a worthwhile career. By the time a man graduates, his seasonal work should have shown him what opportunities are available, what requirements he must meet in order to succeed. His experiences will be much more valuable, his education made more meaningful, and his objectives better clarified if he has received school-supervised training during his periods of summer employment. An analysis of industrial forestry practices shows that much of the routine work of the industrial forester requires in-service training as well as college training. This calls for careful coordination between the personnel program, through which the in-service training is supervised and the course procedures through which the college training is provided.

EMPLOYMENT SERVICE

Closely related to supervision of seasonal employment is employment in general, for graduates as well as for undergraduates. The duty of a school of forestry is not just to educate foresters. It is to educate foresters for the advancement of forestry. There is no better way to advance forestry than to place the right man in the right position. No professional school can escape its responsibilities to prepare men as adequately as possible, and to aid the placement of men so that they will make the best use of the preparation.

If an effective program of seasonal work supervision is carried out by a school, the staff member assigned to the work should be the logical man to conduct placement activities. He should know the capacities of individual students and the requirements of individual employers. This is no small task. The facilities of the school, its counsel, and its data on professional opportunities should not be denied to any forestry graduates, nor to any forestry agencies. Here, if at any point, is an opportunity to discharge the school's obligations to the student, to the state, and to the industries it serves.

To make employment service effective, two things are essential, adequate information on job requirements and adequate information on the capacities of potential employees. To obtain the first, the staff man in charge of the service must have ample opportunity to keep abreast of the changing technology of forestry. He must get into the field, know current operating procedures, and attend forestry conferences. He must be familiar with administrative developments in public agencies and must know company policies in

industry. Trends in forestry which will affect employment must be closely followed. He must be familiar with the normal requirements in public and private forestry, and should be aware of other special situations which might require special training in the school. He must be able to furnish current, *authentic* employment information to students. It would be indefensible laxity, a breach of faith, to give the students employment data that are obsolete or hearsay.

Adequate information on the capacities of potential employees should be available if the personnel system is functioning efficiently. This will be particularly true if there has been some supervision of students' seasonal work. In any event, each student's personal file should show his scores on various tests, his academic standing, the cumulative reports of seasonal employers, and the cumulative analyses of staff advisers. The total of this information should be sufficient to permit fairly accurate placement.

ADMINISTRATION COURSE

Obviously a man embarks upon a professional college career with the hope of attaining a responsible station in life; an administrative or managerial position. However, before he can hope to reach such rank, he must first be a good workman, possessing the knowledges, the skills, and the attitudes of a typical workman in his field. The competition for an initial entering position is so keen that every effort is exerted by the man and by the college to make him technically competent to hold that first job. This is an acceptable short range aim. Certainly the student should be familiar with the techniques of his chosen specialty; but he should not be so occupied with the physical factors that he fails to develop the more important long-range attributes of administrative management. The study of personnel administration should be included in the senior year, closely tied to the personnel program. The work should be undertaken by the head counselor as an informal seminar course. The role of the instructor should be minimized and he should be more or less a chairman of a discussion group (which nevertheless should move on to predetermined objectives). A series of intensive personal conferences with every senior would be more desirable, but limitations of time prevent individual meetings and force group discussion. The purpose of the work should be to orient the undergraduate to his future professional career as the orientation course in the freshman year should attempt to adjust him to his future collegiate career.

To be a competent employee and eventually to become an effective administrator, the undergraduate requires more than course work, seasonal experience, and supervision on summer jobs. There is a considerable difference

in outlook between the college student and the employed forester. It is necessary to bridge this gap, for the conduct of the young forester on his first full-time job will have an important bearing on his later career. In the past, forestry schools were guilty of graduating young men who thought they were automatically to begin as managers because they possessed diplomas. In consequence of this delusion of beginning at the top, some were unable to make a good beginning at the bottom. They failed to become good managers eventually because they failed to be good workmen initially.

Organization—which is done with words—will always be more important, more difficult than any technique in the physical field. The organizers will always get the power because they perform the job. The technicians will always be slaves to the [administrators] until the technicians learn how to handle people, how to think logically outside their own narrow fields, how to talk, and how to live.⁶

The process of developing technical skills should not be antagonistic to the process of developing managerial skills, for the techniques of a competent workman must be appreciated before a man can become a competent manager.

Four major divisions might characterize an administration seminar as proposed here

(1) **OBJECTIVES**. The student should be shown why the course is necessary, where it fits into the school curricula and personnel procedures, how it applies to his future work, and what it will attempt to accomplish.

(2) **INFLUENCING HUMAN BEHAVIOR**. Basic psychological principles influencing the behavior of men should be reviewed briefly to show how the forestry employee (technician) and the forestry employer (administrator) might use them in furthering their objectives.

(3) **PRINCIPLES OF THE COMPETENT EMPLOYEE**. The discussions should include choice of occupation based on objective analysis of personal attitudes, aptitudes, and experiences; and analysis of career opportunities in forestry. The typical entering positions in various branches of forestry should be studied and the personal requirements of employees for each job reviewed, as well as the technical skills appropriate to each. Application of psychological principles should be made to the techniques of securing a position and advancing up the promotional ladder of an organization.

(4) **PRINCIPLES OF THE COMPETENT EMPLOYER**. A basic consideration here should be the relationship between initial workmanship and ultimate managership. Typical public and private forestry occupations should be

⁶Anonymous, "Letter to a Seventeen-year-old Son," *Harper's Magazine*, (August, 1945) 1143, p. 173

analyzed to show the application of principles of leadership, organization, supervision, delegation, in-service training, and overall administrative control.

The task of developing administrative concepts in students cannot be delegated to one formal course in this field. On the contrary, the whole personnel program is pointed in this direction—the aim is to help men to develop managerial capacities. The aim will be accomplished only if all the processes of the school are used as vehicles for the purpose. Personnel conferences or forestry club activities, class work or field trips should be as valuable as the administration course in promoting the administrative potential in students.

FOLLOW-UP

It is not sufficient to hand a man a diploma and then forget him; nor to place him on a job and then dismiss the matter. Schools of forestry must check on the worth of their product, the graduate, not only for the graduate's sake, but also for the critical analysis of school procedures. If the school program is unsatisfactory, this fact will soon be discernible in the conduct of its graduates—if the school examines such conduct. In the best interests of all concerned, the student's career should be followed sympathetically until he becomes established as a seasoned professional man in need of no further counsel from his school.

To check on the forestry school program at Oregon State College, employers of its graduates should be asked for personnel reports on the men. There are several values in this procedure: (1) the graduate is more likely to be an effective employee, knowing that his progress is being subjected to scrutiny; (2) the employer is more likely to provide opportunities for advancement, knowing that the school is comparing the work of men in his employ with that of competitive employers in the same field; (3) graduates with special talents unused in one situation, may be provided opportunities for employment in other fields where those talents might be at a premium; and (4) where graduates are obviously ill-adjusted to their employment, there may be an opportunity to salvage them by re-training, reorientation, or transfer.

The school must check on its graduates to know to what degree it was responsible for their success or failure. Opinions from both graduates and employers should be secured, analyzing the effectiveness of the curricula and the personnel program of the school. If adverse criticism is constantly directed toward any given phase of the school program, the chances are that it is failing both employee and employer and should be modified. Adequate evidence of the need for change should produce a change; this will keep the

school program alive, geared to the needs of its graduates and of the industry which it serves.

The graduate follow-up⁷ will require a system of close control through adequate, up-to-date records of places, types, and times of employment of its men. This will require continuous interviewing of graduates and their employers. There is a specific academic gain for the school in such close relationships with its graduates. In return for analysis and assistance in their employment problems, the graduates are more likely to support the school and assist in its program. In a constantly expanding field such as forestry, the staff cannot know all the intricate details of all forestry processes and must rely on the graduates for technical assistance in special cases. A graduate who has a close association with his school may also be expected to make worthwhile recommendations for changes in its program in the light of his professional experiences. Actual practice will test the worth of many course materials. An additional benefit from close co-operation with graduates is this: as employers, they are likely to provide employment for more graduates if they were themselves given worthwhile assistance and support from the school when they started out as new and untried foresters.

SUMMARY

The belief appears well founded that personnel work is highly important in the practice of professional forestry. It seems obvious that a forestry educational program which neglects personnel phases is incomplete. As much attention must be given to development of administrative potential as to development of professional techniques. The program outlined above is designed to enhance the personnel phase of a forestry education in order to minimize administrative failure. The personnel work should be as much a part of the whole school program as the formal instruction, and should be integrated with the latter at every opportunity.

⁷The follow-up program takes a good deal of effort but the results at Oregon State College have well warranted that effort, as documented by its graduates

Part III. The Curricular Phases of Education in Forest Management

Chapter 9

PROFESSIONAL FORESTRY EDUCATION

INTRODUCTION

I do know that most technical graduates are inadequately prepared to speak and write the *English* language, that they do not have a very sound comprehension of the kind of society in which we live, a knowledge of the structure and functioning of government, and, in short, are not equipped for well-rounded citizenship. It may be agreed that these matters are not the function of technical schools but are the functions of universities and colleges. I believe very strongly that some way must be found to give the kind of education in technical courses that will make men good citizens as well as good technicians.¹

The problems of forestry education are complicated by the diversity which characterizes the profession. For example, there are some 1,100 species of trees in the United States, of which at least 125 are commercially important. An adequate comprehension of the properties and habits of even a small number of these species is difficult; nonetheless, the forester is expected to know a good deal about many of them. In addition, he is expected to be at once self-sufficient in a lonely outpost, and poised in public gatherings; an administrator, and a manual laborer, a scientist, and a rank empiricist. The reconciliation of these conflicting requirements imposes a considerable responsibility upon the forestry curriculum. A forester must also be familiar with distinctions between regions in such matters as the behavior of species, methods of logging, climatic influences upon the forest, and public use of the forest. Fundamental skills and knowledges are required in elementary forestry positions, yet latent administrative capacities must be encouraged for the ultimate advancement of the professional forester.

These are some of the general problems in forestry education. The specific problems are no less complicated. The forester is constantly called upon to make decisions of land use and he must appreciate the interrelationships of all the forest resources. Timber management will normally be a chief responsibility in Oregon and that entails consideration of such major factors as (1) crop rotation, extending 100 years or more; (2) forest ecology; (3) soils; (4) inventory and appraisal of forest properties; (5) financial and administrative principles in managing the growing, harvesting, and

¹Letter from J. A. Hall, Director, Pacific Northwest Forest and Range Experiment Station, Portland, January, 1946

fabricating operations; (6) protection of the forest from fire, insects, and diseases; (7) research techniques for the improvement of forest practice and utilization; and (8) social responsibility in protecting the public interest in timber lands.

In regard to this last point, Graves and Guise say:

So important is this public interest that many countries have found it necessary to maintain extensive forests in public ownership and, in many cases, especially in Europe, to exercise a measure of control over the manner in which private forests are handled

These public aspects of forestry create special administrative and technical problems. Public forests, devoted to the highest public utility of all their resources, require the reconciliation of many conflicting demands and uses that are not ordinarily met with in private forests, and public forest administration is a broad and complex field of forestry in itself. The handling of these various public activities in forestry requires men of special training and ability²

If present social trends continue, the state is certain to assume progressively greater responsibility in areas formerly left to personal action (or inaction).

This requires of the individual a sense of obligation in civic affairs and a greater cooperation with others for the common good. To function effectively in this kind of society the forestry graduate should be able to appreciate principles and problems in human conduct as well as in the professional field.

GENERAL EDUCATION OF FORESTERS³

There is some disagreement between forestry educators concerning the amount of general education and the amount of technical education which should be offered. No substantial arguments could be found in favor of

²Graves and Guise, *op cit*, pp 8-9.

³The following section on general education postulates objectives which the proposed program in Chapter XIII will not attain. Vulnerability of the monograph on this score is acknowledged, and the reasons are explained herewith. The purpose of this work was to set up a program which would be functional, if not ideal. The program as finally established represents a compromise with the ideal, limited as it was by two basic qualifications. (1) The program at Oregon State College is premised on four years of work for the bachelor's degree; hence it would be valueless to include so much general education as to require five years. (2) The Society of American Foresters and state and federal civil service commissions make prescriptive requirements which the School of Forestry must meet if its men are to qualify for appointment. In view of these two limiting factors the proposed program is not ideal from the standpoint of general education, but it is functional (having been adopted in 1947), and it does allow some electives for individual differences, even though it does not require fine arts, philosophy, or psychology. The inclusion of such courses (some of which the writer favors) must wait upon expansion to a five-year program.

increasing the technical aspects of forestry education. The more important reasons for liberalizing the curriculum are cited below.

(1) At the supervisory and executive levels of a profession, those qualities which are enhanced by general education may have greater vocational values than those which are developed by vocational education.

(2) Many men who begin as foresters do not end as foresters. (At Oregon State College some 30 per cent of the foresters drop out of college entirely, at the end of their first year) If these men have received chiefly forestry training, they will have gained but little from attendance, since they are not to become foresters. They still are citizens, and they should have received some education which would contribute to better citizenship. The same principle applies to graduates. Not all graduates of schools of forestry will remain foresters but all will remain citizens. As an agent of a democratic nation, any school of forestry is obligated to attempt the development of responsible citizenship, a trust not adequately requited by the mere imparting of technical skills. Schools of forestry tend to regionalize their professional training and hence to promote sectional gain over national welfare. This must be offset by broader concepts of general instruction.

(3) Certain aspects of general education are prerequisite to vocational education. The technician should have at least some grasp of the common body of knowledge usually possessed by intelligent citizens. He should know the scientific bases of his profession. Nature does not change, but man's use of natural materials does. The technician can learn the natural laws fairly readily, but it is still more important for him to learn flexibility in adapting those natural laws to new purposes of men. This calls for a broader knowledge than is obtained in the narrow confines of a specialist education.

Forestry agencies can supply the on-the-job training in those special techniques which each agency uses in its own operations, the forestry school must supply the general education and the basic tools which are needed to employ experience skillfully, and to meet problems successfully in the various fields of forestry.

A number of authorities may be cited in favor of decreasing the vocational emphasis in a professional education. The Harvard Committee on General Education states

Vocational instruction stands upon a special footing. Success in it dispenses with the need for continuation. It can come to an end, its purposes can be fulfilled. But general education is endless, since it serves those of man's needs which are inexhaustible.⁴

⁴Committee on the Objectives of a General Education in a Free Society, *op. cit.*, p. 260

In Aydelotte's opinion :

All times of strain, such as war or depression, tend to shake men's faith in liberal education. When danger threatens, competence to perform immediate practical tasks is at a premium and the expert takes precedence over the philosopher. Freedom of the mind then seems less useful than the habit of faithfully obeying instructions, but . . . the very foundation of our democracy is our conception of liberal education and the freedom of the mind that it implies.⁵

It is true that a vocation is the principal means through which most individuals find self-expression. The danger lies in an excessive attachment to, or exclusive concern with, the vocation. The Committee on Academic Policy of the Lower Division of Oregon State College believes that vocationalism should not be the sole concern of professional schools. The Committee says :

. . . vocational drive is highly praiseworthy. Vocational competence is a primary objective, but it is not the sole objective. The student may forget—if he ever recognized the fact—that man is a citizen before he is a technician of any kind, that he has social responsibilities and human relationship; that, above all, he is an individual capable of personal development in many directions. The College cannot forget.⁶

Another problem of vocational education is this: while the "practical" studies are being taught, practical life has moved on. The graduate's knowledge is likely to be obsolete before he leaves the school, and his confident knowledge of things no longer true will be more detrimental than ignorance.

Hutchins says in this connection :

All that can be learned in a university is the general principles, the fundamental propositions, the theory of any discipline. The practices of the profession change so rapidly that an attempt to inculcate them may merely succeed in teaching the student habits that will be a disservice to him when he graduates.⁷

A symposium on forestry curriculum revision at Oregon State College was conducted by the Columbia River Section of the Society of American Foresters in 1946. The conference was unanimously in agreement that the forestry content on the technical forestry curriculum was excessive.

The total evidence of all these authorities is in favor of liberalizing the forestry curriculum, and this is proposed in a later chapter. A difficulty inherent in the process is the choice of courses most appropriate to the purpose of general education. The Harvard Committee on General Education

⁵Frank P. Aydelotte, *Breaking the Academic Lock Step*, (New York: Harper and Bros., 1944) p. 1.

⁶Committee on Academic Policy, *General Education in Oregon State College*, (Corvallis: May, 1946) p. 4-5 (Mimeographed).

⁷Robert M. Hutchins, *The Higher Learning in America* (New Haven: Yale University Press, 1936) p. 48.

suggests that general education for individual needs is more important than a prescribed general education *per se*. The Committee says:

The problem of general education is one of combining fixity of aim with diversity in application. It is not a question of providing a general education which will be uniform. It is rather to adapt general education to the needs and intentions of different groups and, so far as possible, to carry its spirit into special education. What is wanted, then, is a general education capable at once of taking on many different forms and yet of representing in all its forms the common knowledge and the common values on which a free society depends.⁸

However, some discrimination must be exercised in the choice of course content to achieve the purposes of general education. Through the Society for the Promotion of Engineering Education, engineers have advanced farther than foresters in formulating educational programs. A recent statement on general education by the Committee on Engineering Education After the War, might serve forestry schools equally well. The Committee says.

The purposes and problems of engineering education hinge on its two major responsibilities. One of these, which determines its aims and standards, is to the public, industry, and the profession it services. The other, which determines its methods, is to the students as individuals. It is responsible to the public for seeing to it that the students emerge from college with an attitude and background appropriate to effective citizenship as professional men, and that they shall have acquired a sustaining interest in the common welfare and the cultural aspects of community life. Engineering education is responsible to industry for educational programs suitable for professional personnel in engineering and management, and to the engineering profession for the maintenance of proper educational standards and the inculcation of ethical attitudes and conduct of its graduates. Finally, it is responsible to the students themselves for an educational program in which they will be treated as individuals and helped to achieve maximum development of mind and character.⁹

The engineers hope to attain these goals through courses which will develop:

- (1) Understanding of the evolution of the social organization within which we live and of the influence of science and engineering on its development
- (2) Ability to recognize and to make a critical analysis of a problem involving special and economic elements, to arrive at an intelligent opinion about it, and to read with discrimination and purpose toward these ends
- (3) Ability to organize thoughts logically and to express them lucidly and convincingly in oral and written English
- (4) Acquaintance with some of the great masterpieces of literature and an understanding of their setting in and influence on civilization
- (5) Development of moral, ethical, and social concepts essential to a satisfying personal philosophy, to a career consistent with the public welfare, and to a sound professional attitude.
- (6) Attainment of an interest and pleasure in those pursuits and thus of an inspiration to continued study.¹⁰

⁸Committee on the Objectives of a General Education in a Free Society, *op cit*, pp. 57-58

⁹Report of the Committee on Engineering Education After the War, *Journal of Engineering Education*, XXXIV (May, 1944) p. 590

¹⁰Report on "Aims and Scope of Engineering Curricula," *Journal of Engineering Education*, XXX (May, 1940) p. 564

The forest management curriculum proposed here would hope to attain some of the same goals. Course materials were chosen with a view to integrating foresters with other campus groups. No specialized courses for forestry students are contemplated. Referring to the numbered statements, above, the following procedures are suggested for attainment of the objectives.

(1) Courses in sociology, forest economics, and a sequence in general science would be offered for this purpose.

(2) Promotion of facility in analysis would be attempted by using the problem-solving approach in as many classes as possible, replacing the previous lecture method. To aid in developing of reading capacity, a reading test, and mandatory remedying of deficiencies would be part of the program.

(3) As a contribution to this objective, speech, technical report writing, and a senior thesis would be required. Deficiencies in English would require further course work in this field,¹¹ and in every technical course English standards would be required to match technical competence.

(4) A sequence in literature would be added, with freedom of choice to permit the greatest possible self-development.¹²

(5) Moral, ethical, and social concepts are keystones of the courses in orientation and administration, and of the personnel program.¹³

(6) This difficult task would be made a primary purpose in all courses and in the adviser's conference.

The proposed forest management curriculum attempts a compromise between a substantial general education and the hard realities of professional requirements. These latter cannot be overlooked. In 1940, eight hundred four candidates who passed the general education section of the Junior Forester examination failed the professional section. It is difficult to meet the urgent technical demands and yet provide a liberal education; however, the proposals made here would include professional essentials and still provide over 20 credit hours of general education beyond that offered in the previous technical forestry curriculum.

Implicit in the whole program is the premise that those facets of social and personal development which are not provided for in the course work are

¹¹Co-operation of the English Department permitted establishment of individualized remedial work for sophomore foresters in 1948.

¹²Within reason, of course; "snap" courses are not accepted.

¹³It might appear that this provision is wholly inadequate to accomplish purposes of such magnitude. Probably it is, probably this goal cannot ever be achieved satisfactorily, but the forestry staff nevertheless *tries* to do so. The implementation of these ideals is an integral part of each day's work in personnel, which means conscious attention by all the staff in all school activities.

to be developed in personnel work. This is one method of extending general education. It will require close coordination between the two complementary phases of the School program.

The general education content proposed in the new curriculum amounts to 43 per cent of the course hours, which happens to agree with the figure established by the Society of American Foresters as a desirable goal. A further analysis, showing an additional breakdown into pretechnical and technical courses within the total is given in Chapter 12.

PROFESSIONAL EDUCATION OF FORESTERS

The professional education of the forester is not to be confined to those years in which he is enrolled in forestry courses at his university.

It should begin then, but if it is to be education of worth, it should also continue throughout his professional career as a result of the combined intellectual habits of acquisition, analysis, and criticism which he should develop during the period of association with his teachers. If this ability and habit of self-education has not been acquired by the student in the forest school, his teaching has not been good and his certificate of graduation has little to commend it.¹¹

The profession of forestry is rapidly expanding. Through extensive research and practice during recent years, a considerable body of forestry subject matter has been built up. Current elaboration of minor phases of the old inclusive divisions of the field has resulted in accumulation of material and subdivision and compartmentalization of curricula. In the early days of forestry instruction, the paucity of technical materials permitted the inclusion of a considerable body of liberal subject materials. Today, repeated fission of the once-adequate forestry courses into many allegedly essential courses has led to an extravagance of professional materials. The bare fact that these segments of forestry exist, is assumed by some educators to be ample justification for their appearance in curricula. The resulting tendency is to overload students with refined fragments of advanced work at the expense of a sound general education. Under these conditions, superficiality in specialization may dominate over competence in fundamentals.

Because background and precedent are largely lacking in American forestry, the forester not only administers but constantly employs basic sciences for the development of still more effective administration. This is an orderly process and does not call for sweeping changes in professional forestry education. It is also true that while the biological facts of the forest are minutely added to from time to time, they change little; natural laws remain absolute; certain tool subjects and basic professional skills required in the early days

¹¹Percy M. Barr, "What Teaching Is of Most Worth?" *Journal of Forestry*, XXXVIII (February, 1940) p. 205

of forestry are still useful. Therefore, the essential core of forestry education has not greatly increased, although it is now surrounded with a great profusion of minor satellite courses. What is needed today is not so much a mastery of all these disjointed items as a change in the emphases of forestry education accurately to reflect the changing times in forestry. These changing times, and the thinking of foresters about them, are elaborated below.

The essence of forestry is the management of forest lands and industries for the continuous production of goods and services. Education need not be esoteric nor complex to enable a student to make himself competent in these fields.

Some of the materials germane to forestry education belong in older established areas of college education, but a considerable quantity of forestry instruction must come from forestry itself. This point of view is expressed by S. T. Dana, Dean of the School of Forestry and Conservation at the University of Michigan, in the following quotation:

Colleges of arts and sciences, of engineering and of business administration can each give the forester a part, but far from all, of what he needs. Paradoxically, these units are at the same time too generalized and too specialized for his purposes . . .

The forester's most obvious occupation is to practice forestry. However, the chief demand is still for the general practitioner who can turn his hand to any part of the job of forest production and utilization. The average "dirt" forester must consequently have a broad grasp of all the main branches of forestry. To give him this involves the difficult educational problem of covering the necessary ground in a reasonable time without spreading the instruction so thin that he learns a little about everything and not much about anything. The opposite danger is that the specialist will learn so much about one thing and so little about other things that he will be unable to relate his specialty to the other aspects of forestry. It is the old problem of how to attain breadth without superficiality, and depth without narrowness.¹⁵

The traditional core materials in technical forestry are silviculture, mensuration, protection, utilization, management, and forest economics. There is no pattern for the various specializations offered. The local requirements for various schools of forestry play determinant roles in the establishment of their curricula. Regional considerations are of greater significance to most schools than national considerations. For example, logging is one course in many schools, but in Oregon, where logging is a vital part of the state's economy, the School of Forestry makes logging engineering a department, offering many courses. Wood products courses and departments

¹⁵Samuel T. Dana, "What Forestry Is—What Foresters Do," *Journal of Forestry*, XLIV (January, 1946) p. 1

are as numerous and diversified as the schools in which they are presented Range and wildlife management appear as departments in some schools, and are wholly lacking in others.

Another important question is the proper division of time between general and professional education. In common with engineering and other technical fields, forestry education faces a difficult task in attempting to educate generally and to train specifically, both in a four year program. The obvious answer is to make the course five years in length, but the worth of this answer is not as obvious. Many of the most able men in forestry today received four years, or less, of formal forestry education. Granted, when these men began their careers, forest administration was less complex than it is today. It is also true, however, that less was known about forestry in those days and they had to develop methods and find their own data as they progressed. The forestry graduate now has available a great many aids in the practice of his profession and there is a vast array of helpful forestry information which was unknown when present leaders of the profession began their careers. The biological bases of the forest have remained unchanged, and the impact of climate upon soil will continue to produce a familiar climax-type vegetation. Thus the fundamental facts of forestry are no more obscure and demand little more education than in the early days of forestry education. What is more obscure is the complicated relationship of forest resource use to society. The solution of these social problems calls more for general education than for professional education, and if forestry curricula are to be increased to five years the increase should probably be in general education. Some forestry educators now argue that a five year program is necessary to accomplish the broader education in forestry. The requirement of a fifth year of education for all foresters raises some questions. There is the social problem of deferring the economic self-sufficiency of students for an added year. There is the certain fact that many graduates eventually will occupy relatively minor positions in the field which will not warrant five years of preparation.¹⁶ It is also possible that a critical analysis of present forestry curricula may permit a workable compromise between four year and five year programs. Graves and Guise say of the five year program

Our conclusion is that five years are desirable for a full professional training in forestry, but that of necessity, for the present at least, there must be provided a four year course that is clearly planned with the definite objective of carrying the student far enough into the range of technical and applied forestry to enable him to practice his vocation and earn a livelihood . . . many of the deficiencies of the

¹⁶Dean Henry Schmitz of the College of Agriculture, Forestry, and Home Economics at the University of Minnesota, argues for placing the baccalaureate degree on a non-professional basis and demanding a fifth year for a professional degree

forest schools are due to the effort to provide in four years a professional training for which a longer period is really necessary

Our contention is that the ground covered in the four year course should be restricted in scope to what can be done thoroughly, with such limitations of material of an advanced, special, or purely descriptive character as may be necessary to permit strengthening the foundational studies¹⁷

One method of expanding the four-year program is by means of a summer camp. Almost every forestry school in the United States now requires one summer in the school camp, in effect making the course four and one-third years long. These camps have a larger purpose than merely to increase instructional time. At many forestry schools the students have little or no chance to become acquainted with forestry until after graduation; they have scant opportunity to test their likes or dislikes for the realities of a forester's life. At most forestry schools the entire instructional program must of necessity be confined to classrooms, with the exceptions of the summer camp. These circumstances do not apply at Oregon State College. With the 6,000-acre school forest only 20 minutes from the campus, the student is introduced to the realities of forestry life in several classes per week. A wide variety of logging operations and utilization plants are visited within an hour of the campus, and many 1-to-3-day field trips are taken during the school year. For these reasons the School does not operate a summer camp. Instead, all students are required to present six months of acceptable forestry experience in the woods or in plants as a prerequisite to graduation. It is felt that a diversity of summer forestry experiences is more valuable to the prospective forester than added classes. In effect, however, this decision means that the Oregon forester should receive in four years an education equivalent to the four and one-third years offered in most other forestry schools. This fact makes even more urgent the revision of forestry education in Oregon.

An intensified four year program is proposed for the School of Forestry at Oregon State College, somewhat as suggested by Graves and Guise. Recognizing the deficiency in general education in forestry it is proposed to increase this at the expense of forestry courses. The Committee on Aims and Scope of Engineering Curricula holds a similar opinion as witness the following quotation:

Undergraduate curricula should be made broader and more fundamental through increased emphasis on basic sciences and humanistic and social studies. This will require greater efficiency in the use of the student's time, to be gained by pruning to the essentials of a sound educational program¹⁸

¹⁷Graves and Guise, *op cit*, pp 106-107.

¹⁸Report of the Committee on Aims and Scope of Engineering Curricula, *op cit*, p 566

The general need for, and place of, discipline other than the widely accepted technical and scientific courses in the forestry curriculum, was recently stated as follows.

When the student leaves the campus for the woods, most of us probably agree that if he has had broadening disciplines in addition to technical and scientific training, he is more apt to achieve some measure of success in earning a living; in living; and in helping society to continue to live¹⁹

The proposed personnel program at Oregon State College is meant to be an important adjunct to classroom procedures in bringing about the stimulus to broader things. What cannot be done through public preaching may be accomplished through friendly personal conferences between student and staff adviser. Here is an opportunity to develop student interest in the wider understandings named above. In addition to enlarging the student horizon through personnel work, it is proposed to implement general education concepts in the School of Forestry by: (1) rigorously eliminating all deadwood, all duplication of courses, and all material retained for traditional reasons; (2) eliminating courses whose chief purpose is to simulate apprenticeship by training the men for immediate on-the-job proficiency; (3) consolidating courses similar in principle, varying only in detail; and (4) changing forestry instruction from subjective to objective emphasis.

To assure adequate coverage of essential material the remaining technical courses should be intensified to give as nearly as possible the *essentials* of a five year program. Professional forestry has expanded so greatly in recent years that no man can hope to learn the whole of it in college. The many divisions of forestry are too multiple to permit the complete *training* of a man to do all things skillfully in any one of the major branches, even in five years. However, it may be possible in four to *educate* him so that he may continue both professional and personal growth after graduation.

An intensive program of this nature should raise the standards of the school by giving the best men a basic education in four years. Less able students might require more than four years to complete the work for a degree. Another factor related to standards is that men who are unsuited to forestry will be deterred more readily if the course is exacting than if it can be mastered with minimum effort. The forestry school is obligated first to graduate those who are competent to profit from, and can contribute to, the forestry profession and industry. The school must not add to social maladjustment by graduating men who are ill-prepared to enter forestry and un-

¹⁹Walter Mulford, "That Something Out Yonder in the Self-Training of a Forester," Division of Education, Society of American Foresters, Salt Lake City, (September, 1946) (Mimeographed, unpagged)

prepared to enter alternative employment. This obligation may be met by revising curricula; by increasing general education and decreasing technical education; and by requiring a rigorous intellectual discipline in the technical course work which remains.

Chapter 10

APPLICATION OF CURRICULUM CONSTRUCTION PRINCIPLES TO FOREST MANAGEMENT EDUCATION

As employed in the discussion below, the word "curriculum" is meant to comprehend more than course work. It is intended to include *all* the processes involved in developing a well-rounded student.¹ For example, the importance of administration is stressed throughout the monograph to such an extent that a reader might be led to expect that more formal attention would be warranted than the one course which appears in the proposed management curriculum. If this were the sole consideration given to personnel management in the whole school program, some apprehension might be entertained as to its adequacy. The "curriculum," or overall educational program, comprehends the stressing of personnel relationships in all courses and in all activities of the School.

For the sake of brevity, the word "curriculum" is used throughout to describe the various processes which contribute to the realization of educational aims in forest management. This principle follows the statement on curriculum definitions by Caswell and Campbell.

A canvass of writers on curriculum problems indicates that most of them deal with the curriculum from the experience point of view. They treat topics and problems in research and discussion which deal with many aspects of the learner's experience in addition to the content employed.

It is general practice for students of the curriculum to include in their writing and research topics and problems that relate to all the varied forces that condition experience.²

With regard to forest management education, the varied forces conditioning experience certainly extend beyond the classroom acquisition of professional knowledges and skills; at Oregon State College they include all the campus activities and forestry field work in which the student engages during his college career. The most important of the extra-class influences is meant to be the personnel program.

¹This understanding of curriculum is favored by the following authors, among others: Hugh B. Wood, *Foundations of Curriculum Planning and Development* (Eugene: University of Oregon Co-Operative Store, 1940) p. 1 (Mimeographed).

Hilda Taba, *The Dynamics of Education* (New York: Harcourt, Brace and Company, 1932) pp. 243-244.

Norton and Norton, *op cit*, p. 548.

²Hollis L. Caswell and Doak S. Campbell, *Curriculum Development* (New York: American Book Company, 1933) p. 67.

To conclude the application of curriculum construction principles to the proposed program in forest education, the curriculum should implement the philosophy of the institution in which it is presented. The program suggested here attempts to do this, throughout all the planning, constant reference was made to the basic philosophy of the School of Forestry as a unit of Oregon State College.

Chapter 11

FACTORS AFFECTING PUBLIC FOREST MANAGEMENT EDUCATION

One of the most recent studies in forest management education has just been completed by the School of Forest, Range, and Wildlife Management at Utah State Agricultural College. The purpose was to revise the School's program to meet the accrediting requirements of the Society of American Foresters. The criteria employed there furnish a guide for the revision of programs in other schools of forestry. Regarding the Utah curriculum revision Dean Turner says.

It is one thing for forest educators to recognize the demand for forest managers, but it is quite another matter to set up a course of study to train men in such a diversified field. What follows is to a considerable extent a reflection of the thinking involved in preparing our own curricula. We found it necessary to consider (1) the field requirements of the wildland managing agencies, (2) actual job possibilities, (3) the faculty, budget, and other resources of the forestry school, (4) the amount of time the student can appropriately invest in his education, determined in considerable part by remuneration after graduation, (5) the importance of providing general education as well as adequate technical training, (6) the limitation of existing civil service examinations, and (7) the requirements of the forest school accrediting committee of the Society of American Foresters¹

Most of the factors cited by Dean Turner are applicable to forest management curriculum construction in Oregon. Reference is made below to his numbered statements. (1) The field requirements of both public and industrial wildland managing agencies have been considered below, both as to their trends, and their current practices. (2) Actual job possibilities are not immediately a concern in Oregon. For the moment, more forestry opportunities exist than can be filled by the graduates of Oregon State College. However, the employment factor will become significant in a year or two, and a separate study is currently under way, looking toward a limitation of forestry enrollment. (3) The faculty and facilities of the School of Forestry at Oregon State College should be adequate to meet their responsibilities; the staff is currently being expanded to its prewar strength. (4, 5) The length of time to be devoted to professional education and the importance of general education in the professional field, have been discussed in previous sections of this study. (6) The limitations of civil service examinations are considered at length in the discussion immediately following. (7) The Society's requirements for accreditation are satisfied in the proposed program.

¹Lewis M. Turner, "Training Wildland Managers," *Journal of Forestry*, XLIV (July, 1946) p. 492

Summarizing from the foregoing, the major influences in public forestry now affecting curriculum construction in forest management in Oregon are (a) the fixed requirements of civil service professional examinations; (b) trends toward future development in management, and (c) current management practices

REQUIREMENTS OF CIVIL SERVICE EXAMINATIONS

The United States Forest Service is the largest employer of public forest managers. Entrance to this branch of federal forestry, and to several other federal bureaus, depends upon the candidate successfully passing the civil service Junior Professional Examination in forestry. The federal Civil Service Commission has established specific lists of courses which the candidate must take in order to qualify for the examinations. The required subjects, therefore, constitute almost an inflexible prescription for the professional course work in forest management.

As of February 1946, the course requirements for admission to the examination for federal professional foresters were

One course in dendrology or taxonomic botany One course in forest ecology, silvics, or plant physiology

Five courses in any combination of forest mensuration, silviculture, forest planting, or forest management

Three courses in any one or in any combination of forest entomology, forest pathology, or forest fire protection

Three courses in wood technology and forest utilization

Two courses in any one or in combination of forest economics, forest finance, forest valuation, or forest history, policy, and law

One course in range management or wildlife management

One course in soil science, forest soils, or geology

Two courses in any one or in any combination of plane surveying and mapping, topographic surveying and mapping, or forest improvements²

The basic requirement for the State of Oregon civil service examination in forestry is that the candidate for the Forester I grade, the entering professional position, must have a college degree with a major in technical forestry or logging engineering. The actual subject matter areas to be covered by the examination are

Group 1: Forest administration

- a. Forest laws, state and federal
- b. Forest taxation
- c. General administrative policies
- d. Forest economics

²United States Civil Service Commission, *Announcement of Duties and Requirements for Forester, P-1* (Washington: Government Printing Office, February, 1946) p. 1

- Group 2 Forest engineering and management
 - a Forest surveying and mapping
 - b. Timber cruising
 - c. Forest appraisals
 - d Forest management plans
- Group 3 Silviculture
 - a Forest ecology, forest practices, forestation
 - b. Dendrology
 - c. Conservation
 - d Utilization
- Group 4 Forest Protection
 - a Fire presuppression
 - b. Fire suppression
 - c. Forest entomology
 - d. Forest pathology³

While some flexibility is permitted, these general outlines are somewhat rigidly prescribed, and any curriculum preparing men for civil service forestry positions must conform to the pattern.

The Civil Service Committee of the Society of American Foresters recommends the following distribution of forest management subject matter in the federal professional examination for foresters.

1 Silviculture, including dendrology, ecology, forest practices, and forest influences	20 per cent
2 Protection, including fire, entomology, and pathology	10 per cent
3 Mensuration and surveying	15 per cent
4 Management	15 per cent
5 Economics, including land use, policy, and taxation	15 per cent
6 Wood technology and utilization	15 per cent
7 Range management	5 per cent
8 Wildlife and recreation	5 per cent

Since 1941, when these recommendations were made, the federal civil service examinations have quite closely adhered to the proposed division of subject matter. It follows that a curriculum designed to prepare men for entrance to these civil service positions should be in harmony with the recommendations. This fact has been taken into account in the proposed forest management curriculum

³Letter from George Spaur, Deputy State Forester, Salem, Oregon, July, 1946

TRENDS IN PUBLIC MANAGEMENT

The most important current trends in public forest management appear to be: (a) an increasing assumption of forestry responsibilities by states,⁴ (b) a great expansion in federal forestry activities, changing from the old concept of resource preservation to the new concept of resource utilization; and (c) increasing regulation of private lumbering operations by both state and national governments.

GROWTH OF STATE FORESTRY The states were generally remiss in their forest obligations until recently. For years almost their sole concern was fire fighting. Another activity was tree planting, and most forested states supported a tree nursery, with federal aid. The more fundamental aspects of overall forest land management, however, did not receive attention from many states until recently. Since 1940, Oregon, Washington, California, and a number of eastern states, have passed laws regulating private forestry. These laws were not very comprehensive, in their initial phases representing only minimum standards of forest practice. The Oregon law has been improved by amendments, and the changes being asked of the 1947 legislature, if passed, will make it a truly effective forest management measure.⁵ Thus, from the rudest kind of practices in past decades, state forestry in Oregon has rapidly improved. It now embraces protection, research, and conservation activities which place its forest management upon a professional plane. Oregon's forestry laws and policies are now recognized as outstanding in the nation. This circumstance is acknowledged by the State Civil Service Commission. In the old days, state forestry department personnel were hired because they were fire fighters, in the future they will be engaged because they have passed an examination in professional forestry. The School of Forestry must acknowledge the improving standards of state forestry in its forest management curriculum.

EXPANSION OF FEDERAL FORESTRY The expansion of federal forestry activities in Oregon in the last few decades has included not only an increase in types of activities but also an increase in numbers of agencies. In addition to the Forest Service, other federal agencies in Oregon employing foresters are the National Park Service, the Indian Service, and the Bureau of Land

⁴County governments have been notably irresponsible in forest management. A number of counties in Oregon own extensive timberlands, but only one county engaged a forester prior to 1947.

⁵The essential changes were made in 1947.

Management.⁶ The National Park Service recruits employees mostly from sources other than forestry schools, and hence is neither largely concerned with forest management education, nor affects it to any extent. The Indian Service in broad principle conducts its forest management as does the Forest Service, and secures employees from the same civil service roster. The influence of this agency upon forest management in Oregon is not of great significance because of the limited holdings in this state.⁷ The Bureau of Land Management, however, is a local organization of strategic forest management significance because its holdings are checker-boarded with other forest lands throughout western Oregon. The trends in Bureau ("O & C") management, therefore, directly affect trends upon the intermingled private lands which are often an integral part of the same logging operation.

The direction of Bureau management is no longer a trend, but a certainty. Federal management of the lands began about thirty years ago, when title to the property was reverted in the United States after irregularity in disposal of the lands by the grantee, the Oregon and California Railroad. In 1937, new administrative procedures were established, recognizing that the disposal policy previously applied to these lands was contrary to the public interest. The regional director of the Bureau of Land Management says:

The old policy accordingly was completely reversed and replaced by a plan which requires conservation of the forest resource through a logical plan of management. This plan, while providing for prudent use of mature timber, requires that timber cutting shall be conducted in accordance with the sustained yield principle.

This practice will be implemented by legislation which contains:

specific legal authority granted by Congress to make cooperative agreements with private timber owners for the purpose of combining federal and private forests in units and managing both together in accordance with the principles of sustained yield. The law itself stresses certain objectives which are to be attained, including among them economic stability of local communities and industries as well as permanency of timber supply.

The principal activity of the Bureau Administration is thus timber management. This circumstance bears upon curriculum construction in forest management in Oregon because of its greater concern with economics and utilization than with the multiple use concept of the Forest Service.

⁶The most important forestry branch of the Bureau of Land Management is the former Oregon and California Revested Lands Administration, known throughout western forestry as the "O & C."

⁷In all justice, it should be said that the forest management practiced by the Indian Service is of a very high order. The work on the Klamath Reservation is outstanding.

⁸W. H. Horning, "The O & C Lands—An Adjustment and an Experiment in Forest Conservation," *The Commonwealth Review*, XXII (January, 1941) p. 241.

⁹*Ibid.*, p. 241.

The physical property of the Forest Service in Oregon has grown from one inactive preserve in 1893, to thirteen busy national forests in 1947. These forests now constitute the major timber ownership in Oregon, and the Forest Service is the largest individual employer of foresters in the State, as it is in the nation. For this reason, trends in Forest Service management are of prime significance to forestry education in Oregon.

In the early years of Forest Service work in this state the management of public forest properties was a relatively simple task, chiefly custodianship. Today, management has entered a new phase in which emphasis is being placed on sound, thorough resource management and better utilization of the forest products. Two phases of this resource management are especially significant, and there is every indication that they will become more important as time goes on. These are recreation and timber management.

The tremendous recreational use of the national forests requires the employment of many recreation guards, a type of employee unthought of in the early days of federal forestry. Strong says:

do the men selected for the original purposes of the Service also possess the interest of men dealing with people? Seemingly, 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.¹⁰

In view of the current importance of recreation, the trend toward a shorter work week, and hence more recreation, it is essential that foresters be aware of considerations of forest recreation in a curriculum in forest management.¹¹

Timber management is the heart of forest management in this region. The rapid increase in its importance in the national forests of the Pacific Northwest may be appreciated from this fact. In the last two or three years, timber sale revenues from these forests have been double the revenues from all the national forests in the United States a decade ago. War-inspired industrial operations now abound in the once quiescent federal forests, creating a volume of business unparalleled in their history.¹² Comparison of rangers' work loads shows little time spent on timber management twenty years ago,

¹⁰Strong, *op cit*, pp 168-170

¹¹In the technical forestry curriculum of 1940, recreation was given the status of a major option, while other more important facets of multiple use forestry were reduced to minors or ignored. It is proposed here to restore recreation to its proper status as a minor, but to include recreation concepts with other equal multiple use considerations in a new course in integrated forest management (see note 2, p 110).

¹²Five new ranger districts were created by the U. S. Forest Service in Washington and Oregon in 1945-46 to share the increased timber management load, and further division of districts is contemplated. The Bureau of Land Management also established six large administrative districts in western Oregon between 1938 and 1948.

but on one typical western Oregon district in 1945, 989 hours out of an annual total of 2,375 were devoted to this work. Timber management, a phase of resource utilization, has displaced resource preservation as the one-time chief occupation of the forest ranger.

This trend will continue. The recently enacted "Sustained Yield Bill"¹³ empowers federal timber-owning agencies to enter into long-time cooperative agreements with individual lumber companies for the orderly harvesting of adjoining timber holdings. This law further extends industrial operations in the public forests and puts the federal government into close association with log production, from which it remained almost aloof during the early years of federal forest management. The Forest Service or Bureau of Land Management ranger will not need to become a logger because of this development, since federal forest management stops short of the actual harvesting. The intelligent discharge of timber sale duties in both agencies, however, requires an appreciation of logging. In the many interviews conducted with forestry graduates, the men in public employ consistently deplored the school's lack of attention to the industrial problems which they were now encountering on public lands. This is an argument for extension of management concepts to include the industrial point of view.

A relatively recent trend is the management of farm forests. The responsibility of the forestry school in this connection is stated in the following quotation:

Farm woodlots loom as a tremendously important factor in the nation's forestry setup. They have contributed an astonishing volume of wood during the war. There are places where ninety per cent of woodland owners are practicing good forestry, and there are other localities where fewer than one man in ten ever knows the meaning of the term. And in most cases such conditions are related to the extent and quality of forest education available in these areas.¹⁴

The significance of the farm contribution to forestry may be appreciated from the fact that half of the nation's forest land is on farms, and in western Oregon, a substantial proportion of the forest land falls in this category. As other timber supplies are depleted, attention is directed more and more to this source. Originally, the federal Extension Service, in cooperation with the various states, was the only public agency interested in farm forests. Now many public and some industrial forestry agencies are employing men to aid the farmer in the management of his woodlot. This trend will accelerate rapidly, in view of which the proposed curriculum in management

¹³Public Law 273 (1944) enables the establishment of sustained yield forest units by federal timber-owning agencies in cooperation with adjacent private forest owners.

¹⁴Anonymous, Editorial, *American Forests*, LI (September, 1945) p. 423.

includes provision for elective work in farm forestry, as a service to the farmer.

PUBLIC REGULATION OF PRIVATE FORESTRY No subject in American forestry has aroused greater dissension than the topic of public regulation of private forestry. The arguments for and against are numberless. The stoutest protest against national regulation comes from the Pacific Northwest. As an offset to federal control, the forest industry here has sponsored state regulation and industrial self-regulation.

The position of those who advocate federal regulation is stated by the chief forester of the United States as follows:

(1) Regulation of practices on private forest land under federal leadership in more positive form than financial aid to the states alone. The states, however, would have opportunity to enact and effectuate regulations, meeting standards defined in the federal law.

(2) Better protection from fire, insects, and disease, and a broadening of public aids to facilitate good private forest management.

(3) Public acquisition of forest lands where watershed or recreational values are so important, or growth conditions so adverse, that private owners cannot be expected to give the management required by the public interest, and of certain areas of merchantable timber, control of which may vitally influence the management of adjacent national forest lands or affect the welfare of dependent communities.¹⁵

Former Governor Charles A. Sprague of Oregon is in favor of forest conservation sponsored by the states. He has said:

What is logged-off land but the harvest of ripe timber? Man was not merely a cruel and greedy beast when he cut down the trees, he was seizing them as he always has the resources of nature, for what he thought was a higher utility.

We have been talking conservation and reforestation so many years that we may be lost in our own bewilderment. But we dare not remain in this state of confusion any longer. Action is needed, state action. It must be in cooperation with private owners and with other public owners such as counties and the federal government.¹⁶

A consulting forester, B. P. Kirkland, takes issue with public forest managers in this region, challenging their computations of forest growth and yield. He maintains that the sustained yield capacity of private forests is not declining; hence by implication, there is no great need for public regulation of these lands. His analysis of the potential allowable cut, he says, shows the need for a new approach to management on the part of public foresters.

The private operators claim that nowhere is the trend toward permanent forest management more apparent than in the Pacific Northwest, that nowhere has industry leadership contributed so much toward permanent for-

¹⁵Watts, *op cit*, pp 113-114

¹⁶Charles A. Sprague, "Symposium on Regulation," *West Coast Lumberman*, LXVIII (January, 1941) p 20

estry as in Washington and Oregon. They cite many instances in which operators have changed over to permanent plans for forestry as examples of the ability and the desire of the lumber industry to regulate itself. One of the fairest statements of constructive industry leadership was recently made by Colonel W. B. Greeley. He said:

Nothing is more important today to the enlightened self-interest of our wood-using industries and the principal groups of wood consumers, than to assure an adequate and stable supply of raw materials within the United States. This all boils down to the need for growing more trees. Forestry has become the No. 1 job of all industries which depend upon wood.¹⁷

These diverse points of view have been quoted to show the extent of the trend toward regulation of timber cutting, whether from within or without the forest industry. The significance of all this in forest management curriculum construction lies in the great need for clear analysis of forest problems by professional foresters. The analysis will not be rational if public forest managers think with one set of values, and private forest managers with another. From this point derives a significant consideration in forest management education—so that graduates be not prejudiced, a forest management curriculum must include, for both public and private foresters, the same basic sciences and tool subjects, and other materials contributing to decisions of policy. *These considerations must be presented from the viewpoints of both public and industrial forestry*

ANALYSIS OF PUBLIC FOREST MANAGEMENT PRACTICES

It is essential that students be familiar with the principles and problems of current practices in their professional fields today because they will be the points of departure for better practices tomorrow. Major changes of procedure within a large organization develop slowly, and if a student knows the broad principles of its operations, he should be able to discharge acceptably the minor details of specific assignments.

The work of public forest management has expanded greatly in recent years, particularly so during and after the war. A generalized statement of management techniques is no longer a useful criterion for the guidance of the beginning forester, or for the curriculum builder. It was shown above that civil service examination requirements prescribe certain courses; actual employment in civil service forestry positions almost prescribes certain other courses. This is not to say that a potential forester must receive apprentice-type training courses at the expense of receiving an education. He cannot

¹⁷W. B. Greeley, *Trees for America*, (Washington: American Forest Products Industries, Inc., 1946) pp. 9-10

become an effective forester unless he has some acquaintance with the responsibilities of a forester; he cannot become an effective administrator unless he knows the limitations and probabilities inherent in the work which he is administering.

State forest management in Oregon is of recent origin. Because the work is still new, no extensive analysis has yet been made of the various responsibilities of the forester in state employ. The general scope of his work is indicated by the following description of the duties of the Forester I position, which corresponds to the Professional I classification in federal service:

Distinguishing Features of Work

This is technical forestry work of a routine or beginning professional nature.

Work in this class includes a variety of technical assignments in the state forestry program. Employees have only limited supervisory or technical responsibilities and normally work under close professional guidance on technical forestry problems. Assignments are usually technically detailed in nature, although as employees gain experience, they work with greater independence of action. Examples of Work (Any position may not include all of the duties listed nor do the listed examples include all tasks which may be found in positions of this class).

Assists in the inspection of current logging operations for compliance with conservation law.

Assists in conducting seed source surveys on completed logging operations to determine violation status.

Assists in conducting stocking surveys to determine planting required on areas cut in violation of the Act.

Assists in supervising planting projects to rehabilitate lands cut in violation of the Conservation Act

Assists in conducting research projects to gather information needed for Conservation Act enforcement.

Assists in forest fire suppression during the fire season.

Performs related work as required.

Desirable Knowledge Skills and Abilities

Working knowledge of the technical aspects of forestry

Working knowledge of fire prevention and fire fighting methods as applied to forest areas.

Working knowledge of public forestry administration and the pertinent laws.

Ability to follow technical instructions and to carry on minor research projects independently.

Ability to establish and maintain cooperative relationships with other employees and with the public

Minimum Experience and Training (The following statement represents the minimum experience and training standards which will be used to admit or reject applicants for tests).

Graduation from a four year college or university with major courses in forestry or logging engineering; or any equivalent combination of experience and training¹⁸

This, the only available statement of the responsibilities of a state-employed forester in Oregon, is insufficiently detailed to provide a complete guide to curriculum construction in forest management. A more comprehensive survey of the work of a public forest manager is obtained from the previously-mentioned work load analysis of the Forest Service ranger. The general professional requirements of the ranger in the past have exceeded those of a comparable state employee; and the specific differences in type of work are not significant enough to invalidate the use of the federal analysis to cover both fields of employment.¹⁹ The Forest Service work load analysis of the ranger position in the Pacific Northwest is, therefore, used to give direction to curriculum construction in forest management. A curriculum based on these premises will serve equally well the purposes of the Indian Service and the Bureau of Land Management because they recruit junior foresters from the same civil service roster which supplies Forest Service employees.

In the Forest Service job analysis, the 200-odd management tasks of the ranger are broken down into 15 major classifications. The chief responsibilities in each classification are listed. Each of these individual responsibilities has been analyzed²⁰ to determine whether or not the present curriculum at Oregon State College is adequate in the given case. Where a new course or new emphasis in an old course is required, this circumstance is recorded. Where the major responsibility for education in a particular classification rests with on-job training, the letter "J" is added. The following pages show the results of this survey.

¹⁸State Civil Service Commission, Salem, Oregon, July 1946

¹⁹Oregon State forestry employees are still concerned chiefly with fire fighting, the enforcement of fire laws, and with regulation of timber cutting. They are not yet as extensively engaged in the comprehensive resource management which characterizes the federal employee. As the State acquires more forest land, broader management responsibilities will accrue and the curriculum should anticipate this development.

²⁰In collaboration with Forest Service and State Forestry Department administrators familiar with the School program

WORK LOAD ANALYSIS, FOREST RANGER²¹

JOB CLASSIFICATION FIRE CONTROL-PREVENTION

(1, 5, J) Maintain fire prevention plans and maps, (4, 5, J) issue fire and burning permits; (1) make personal fire prevention contacts; (1, 2, J) issue fire prevention news items, letters, exhibits, motion pictures and sign plan; (2) make group fire prevention contacts; (3, J) reduce special hazards; (3, J) inspect sawmills and similar industrial hazards on private lands within ranger district, (3, 6) inspect logging operations and slash; (3) supervise brush disposal crews and slash disposal on timber sales, (1, 5) apply, enforce, and terminate closures; (J) investigate man-caused fires and take appropriate action

Curriculum coverage

(1) Forest protection, (2) General forestry; (3) Forest practices

Courses needed

(4) Forest management, (5) Fire control, (6) Logging Engineering

JOB CLASSIFICATION FIRE CONTROL-PRESUPPRESSION

(1, 2) Prepare and maintain presuppression maps and plans; (2, 4, J) maintain, check, assemble, and distribute fire equipment; (2, 3) supervise and train guards in use of fire danger stations, (J) recruit fire guards, (5, J) train guards, (5, J) train and supervise guards on the job, (3, 5) recruit, train, and supervise suppression crews and forest service project crews, (3, 5, 6, J) organize and train co-operating logging and industrial crews; (3, 5, J) recruit, organize and train emergency guards and fire co-operators; (2) maintain co-operative fire control agreements; (2) participate in co-operative fire control activities; (2-5) supervise and inspect all phases of presuppression work, (2-5, J) participate in fire control meetings, training details, and fire schools

Curriculum coverage

(1) Forest protection

Courses needed.

(2) Fire control, (3) Forest management, (4) Heat engines, (5) Administration, (6) Industrial forest administration

JOB CLASSIFICATION FIRE CONTROL-SUPPRESSION

(1, 6, J) Mobilize, dispatch, inspect, supervise, and control efforts on going fires; (5) check performance of delegated duties, (1, 5, 6) review suppression action, (2, 3, 4) prepare damage appraisals and maps, (J) make out fire reports, (1, 2, 6) construct and maintain fire control improvements

Curriculum coverage

(1) Forest protection, (2) Forest engineering, (3) Mensuration, (4) Silvics

Courses needed

(5) Administration; (6) Fire control

JOB CLASSIFICATION TIMBER MANAGEMENT

(1-16 inc, J) Participate in preparation and maintenance of overall management plans; (1-15 inc) establish timber management units; (6, 8) maintain timber and cutover survey records; (7, 8, 12) administer timber surveys, train and inspect crews, (6, 7) administer cutover surveys, (12-15, J) administer larger sales, including (1, 2, 8) appraisal, (1, 12, J) contracts, (11, J) timber sale fire plan, (5, 7, 9, 14, 15, J) logging plan, (1, 5 J) marking, (8, J) scaling, (5, 11, J) slash disposal plans and burning, (J) cutting reports, (1) make

²¹Numbers in parentheses refer to courses now available, or needed in the curriculum, to provide coverage on the topic; J indicates on-job training also needed

Christmas tree sales; (1, 2, 3, J) conduct timber exchange; (1, 5, 13, J) issue free use permits; (1, 7, 13) supervise timber trespass and settlement; (6) investigate crops, report, collect, extract, and store seed, (1, 4, 6) make planting plans, (6, 7) conduct planting surveys, examine plantations, (10) survey insect, disease, rodent infestation, and conduct control, (1, 5, 7) make survey and conduct timber stand improvement; (1-16 inc) co-operate on timber management research projects

Curriculum coverage

(1) Timber management, (2) Forest economics, (3) Forest valuation, (4) Silvics, (5) Forest practices, (6) Forestation; (7) Forest engineering; (8) Mensuration, (9) Logging methods

Courses needed

(10) Forest protection (new emphasis), (11) Fire control, (12) Administration, (13) Forest management, (14) Industrial forest administration, (15) Logging engineering, (16) Aerial photo interpretation

JOB CLASSIFICATION RANGE MANAGEMENT

(1, 3, 4, J) Prepare, maintain grazing unit plans, (1, 3, 4, J) establish grazing units, (1) count stock, (1) supervise driveway use, (1-4, J) administer ranges, (1, 3, 4, J) prepare grazing reports, (J) protect range from trespass, (1-4, J) check allotments and use permits, (1, 4, J) co-operate with livestock associations and other agencies, (1, 3, 4) conduct range management studies in cooperation with Experiment Station and other agencies

Curriculum coverage

(1) Range management; (2) General forestry; (3) Supporting courses in range management minor

Courses needed

(4) Forest management

JOB CLASSIFICATION WATER MANAGEMENT

(1, 2, 3, J) Prepare and maintain water resource plans, (1, 2, 3, J) participate in erosion and flood control plans; (3, J) collect water use data, collect precipitation and stream data, (1, 2, 3, J) co-operate on water research projects

Curriculum coverage

(1) Silvics

Courses needed

(2) Forest management; (3) Forest influences elective

JOB CLASSIFICATION WILDLIFE MANAGEMENT

(1, 2) Prepare, maintain wildlife unit plans, (1, 2) conduct wildlife surveys; (2) co-ordinate wildlife with other uses, (1) conduct census; (J) requisition fish, and aid in fish planting, (2, 3) co-operate with State agencies, other government departments, public and private groups, (1, J) construct, maintain wildlife improvements; (1, 2, J) conduct administrative studies and co-operate on wildlife research projects

Curriculum coverage

(1) Elective forest wildlife courses

Courses needed

(2) Forest management; (3) Administration

JOB CLASSIFICATION RECREATION

(1-6) Prepare, maintain forest recreation resource plans and maps, (2-6) prepare recreation unit plans and maps; (2-6) supervise recreation use, (J) inspect campgrounds, picnic areas, winter sports areas, organization camps; (5, J) recruit, select, train, supervise, and inspect recreation guards

Curriculum coverage

(1) Park forestry, (2) Forest engineering, (3) Forest recreation

Courses needed

(4) Forest management; (5) Administration, (6) Landscape electives

JOB CLASSIFICATION SPECIAL LAND USE

(1, 2, 3) Examine and report on land claims; (3, 4) act on special use applications and issue permits, (J) administer special use permits; (1, 3, J) inspect lands, protect from trespass, (1, 2, 3, J) participate in land use planning activities

Curriculum coverage

(1) Forest land use, (2) Forest economics (new emphasis)

Courses needed

(3) Forest management

JOB CLASSIFICATION ACQUISITION

(1, 2, 3) Conduct land exchange examinations, (2) co-operate with General Land Office on surveys, establish corners, (2) prepare and maintain land status and ownership records

Curriculum coverage

(1) Mensuration, (2) Forest engineering, (3) Forestation (new emphasis)

Courses needed

None

JOB CLASSIFICATION STATE AND PRIVATE FORESTRY

(1, 5) Enforce State fire laws, (3) slash disposal on private lands within protective units, (2, 3, 4) co-operate on logging operations

Curriculum coverage

(1) Forest protection; (2) Logging methods, (3) Forest practices

Courses needed

(4) Logging engineering; (5) Fire control

JOB CLASSIFICATION GENERAL ADMINISTRATION—PERSONNEL

(1) Handle job applications, (1, J) initiate Civil Service appointments, (J) prepare personnel reports and maintain records, (1, J) train personnel, participate in training details, (1, J) maintain safe working conditions for personnel

Curriculum coverage.

None

Courses needed

(1) Administration

JOB CLASSIFICATION GENERAL ADMINISTRATION—EDUCATION AND INFORMATION

(1, 2, 3, 4) Conduct forest extension activities, maintain goodwill contacts, make informational trips with picked groups; establish exhibits, arrange for shows, news items, distribution of literature

Curriculum coverage

(1) General forestry, (2) Orientation

Courses needed

(3) Technical report writing; (4) Journalism electives

JOB CLASSIFICATION GENERAL ADMINISTRATION—IMPROVEMENT

(1, 2, J) Maintain road and trail maps, progress records, communication plans, building plans, (1, 2, J) recruit, equip, train, supply, inspect, and terminate improvement crews; (J) maintain headquarters and guard stations, (1) post boundaries

Curriculum coverage

(1) Forest engineering

Courses needed

(2) Administration

JOB CLASSIFICATION GENERAL ADMINISTRATION—MISCELLANEOUS

(2, J) Conduct organization studies, analyze job loads, prepare and check work plans, train year-long men, (1) facilitate general surveys, post map corrections; (3, J) maintain vehicles and equipment; (J) miscellaneous office and administrative routine

Curriculum coverage

(1) Forest engineering

Courses needed

(2) Administration, (3) Heat engines

SUMMARY

In recapitulation, the chief factors affecting public forestry phases of forest management education are ²²

(1) The requirements of civil service examinations

The courses required by both federal and state civil service commissions are included in the proposed program. The distribution of courses meets the requirements of the Society of American Foresters, and closely approximates the division of subject matter recommended by the Society's Civil Service Committee.

(2) Current trends in public forest management

The growth of federal agencies and the expansion of state forestry both tend toward multiple-use concepts. This observation is substantiated by the analysis of a public forester's work. The old aim of preserving the forest has been supplanted by the aim of utilizing and yet perpetuating the forest resources. To meet this need, the emphasis in the proposed program is on overall management, decreasing the previous emphasis on techniques. The tendency toward regulation of private forestry and the increased industrial operations on public lands, both call for an appreciation of industry's principles and problems. This requirement is met by provision of new courses dealing with industrial forestry, and by inclusion of industrial points of view in all management course work.

It would be indefensible if school procedures regimented management students into two opposed camps—public and private. The intent of the basic management curriculum offered here is to *require* the courses essential to the practice of sound forest management, regardless of ownership. The student

²²Compare summary of industrial forestry phases, p 106

then may *elect* such work as is useful in the specialized method of either field. The presentation of all forestry courses is intended to heighten the appreciation of principles and problems in both management fields. The number of subjects listed under "Courses needed" in the analysis above show the necessity for curriculum revision if these aims are to be attained

Chapter 12

FACTORS AFFECTING INDUSTRIAL FOREST MANAGEMENT EDUCATION

TRENDS IN INDUSTRIAL FORESTRY

In the early days of Pacific Northwest lumbering, there was no industrial forest management worthy of the name. There were reasons for this circumstance, and because it affects forestry education today, this background should be examined. One of the most important reasons for early forest exploitation was the myth of inexhaustibility; it was universally thought that the Northwest forests were too extensive ever to be depleted. Another significant reason is found in the economic environment in which the Northwest forest industry developed. A few generations ago there was very little manufacturing in this area, and the region operated under a colonial-type economy. As population pressure increased, it became necessary to increase production and to export large units of local raw materials in return for relatively small units of manufactured articles for local use. The chief exploitable resource was wood, and hence the Douglas-fir¹ forest bore the major cost of opening up the Northwest. Colonel Greeley summarizes the effect of that exploitation as follows:

Douglas fir had to pay its freight across the continent and undersell the familiar woods of the East. Costs were pared down to the last nickel. Volume production was the industry's god, it became the industry's devil. When building and lumber production dropped off, their own Frankenstein drove the mills into cut-throat competition. Timber remained excessively cheap. Men conserve things which have value; and what business man would spend money to grow timber when he could still buy virgin stuff over the far ridge for fifty cents a thousand feet?²

Under these conditions it seemed senseless for lumber companies to employ foresters to grow trees, and very few *did* employ foresters before the first World War.

The change from the cut-out-and-move-on philosophy of those days to the sustained yield policies of the more progressive companies today is illustrated in the following quotation:

let me ask, why are we practicing forestry? To preserve fish and game? Yes. To maintain the natural beauty? Of course. To make jobs? Certainly. Are we practicing forestry solely for the sake of growing and protecting trees? Yes,

¹Recent changes in technical nomenclature account for differences in the spelling of Douglas-fir.

²W. B. Greeley, "Faith in the Land," *American Forests*, LI (April, 1945) pp 152-153.

in part But none of these reasons is an end in itself The stated policy of the private forest enterprise with which I am associated is as follows

The policy of the Weyerhaeuser Timber Company is to operate its property in such a way as to provide a permanent and profitable investment for capital, to bring about continuous, profitable, and enjoyable employment for men, and to furnish society with uninterrupted supplies of forest products³

Few forestry schools gave thought in their early days to the preparation of men for what then appeared to be the sterile field of industrial forestry. At Oregon Agricultural College, as elsewhere, the forestry curriculum was aimed at preparing men for the civil service examination prerequisite to employment in the federal forest service The course requirements for that examination were prescriptive and excluded consideration of other courses which would have been of value to the industry

The Pacific Logging Congress recognized this situation, and in 1913 asked the Oregon Agricultural College to offer a separate curriculum in logging engineering; that is, in *logging*, not in *forest management* As originally established, the course aimed at the efficient extraction of logs from the forest, not at the perpetuation of the forest. The work did not contemplate industrial *forestry* education, for it was not yet appreciated that eventually the lumbermen would have to grow the trees which they planned to cut In 1913 the aim of public forestry was to preserve trees, and the aim of the forest industry was to log trees These goals were so far apart that wide differences in training between public and private foresters seemed logical, and were generally accepted. It is unfortunate that a broader vision of industrial forestry was not entertained at that time because the establishment of a curriculum in *logging* was assumed to fill the whole of industry's *forestry* needs

Throughout the years, false reliance upon logging as the end-all of industrial forestry has perpetuated the differences between forestry and logging, and has probably retarded the progress of industrial forestry Today, company foresters are engaged in thinning young stands, salvaging damaged stands, and re-logging old operating areas All these functions supplement the work of the logging department, and the two branches must be able to cooperate effectively if the best interest of the employer is to be advanced Here is an argument for more industrial forestry in the management curriculum (and for more management in the logging curriculum).

Foresters for years were assumed to be solely civil servants; starry-eyed, impractical romanticists, according to some industrialists Industry

³R. P. Conklin, "Trends Toward Improved Cutting Practices on Private Lands in the Douglas Fir Region," *Journal of Forestry*, XXXIX (November, 1941) p. 954

men were assumed to be solely selfish individualists, forest devastators, according to some public foresters. So long as these points of view obtained, there was little chance of public forestry becoming more practical or of industrial forestry becoming more professional.

In the early days, the great bulk of timber cutting in the west was concentrated on private lands, and there was not much contact between private or public foresters. Public foresters showed little concern for, or appreciation of, the problems of private operators, and in general, the private operators were disinterested in the practice of forestry. More than twenty years ago, however, some of the leaders of the industry recognized that sooner or later they *must* practice forestry. As early as 1923, E. T. Allen, then forester for the Western Forestry and Conservation Association, expressed his appreciation of changing forestry conditions in these words:

the essence of the American forestry problem is that every forested country proceeds through well defined stages of economic development, during each of which certain things are or are not possible, and that the measure of public intelligence is not in deploring the past, but the capacity to recognize the arrival of changed conditions and make desirable adjustment to fit them with the least past-engendered prejudice and conflict⁴

Specific application of this general principle to Northwestern forestry was made by George S. Long in the same year when he said:

We are exceedingly anxious to get into this reforestation game. We realize the necessity for it very keenly; and out here where the West ends, we want to begin to grow a new forest and will do it when we have the slightest chance of making it a possibly profitable enterprise.⁵

The changing times did force a gradual reorientation in the thinking of many public and private foresters. The day is done when logging began and ended with getting logs, just *timber cutting*. On any substantial operation today, before logging begins and after it ends, *timber cropping*, or forest management, must be a prime consideration.

There are good reasons why this is so. With the depletion of local and regional supplies of timber there is an inevitable increase in log cost due to remoteness, more expensive logging, and poorer stands. Under these conditions, lumber is handicapped in the struggle to hold a competitive position and to obtain its share of new business. This fact creates a favorable environment for the industrial forester; it is now profitable to employ him to evaluate, acquire, and manage accessible cutover lands. The increase in the holdings of cutover lands by large operators, and the intensive management of

⁴E. T. Allen, "America's Transition from Old Forests to New," *American Forestry Magazine*, XXII (February, 1923) p. 106.

⁵W. B. Greeley, "Faith in the Land," *American Forests*, LI (April, 1945) p. 156, quoting George S. Long.

these lands by industrial foresters is one of the more important trends in industrial forestry today.

Summarizing a decade of progress in Douglas-fir forestry, a prominent forester said, in 1943.

The past decade has marked the change from forest liquidation to forest management in the Douglas fir region. The change has been progressive. Managed holdings have existed for many years, but it is in the decade just finished that the emphasis has shifted conspicuously from just forest protection to woods practice planned to produce new timber crops.⁶

The so-called Sustained Yield Bill has given great impetus to industrial forest management, and this requires the services of foresters who are alert to the principles and problems of industrial operations as well as those of public forestry. With few exceptions, industrial forest operations in the future will either practice forestry or pass out of the picture. As the private timber holdings decline, a much larger proportion of the cut must come from public forests. Such cutting certainly will be regulated by the standards of the public forestry agencies. In the past, the cutting without benefit of forestry on private lands often has not met public standards. In the future, the kind of cutting on all private lands will receive close scrutiny when the private owner applies for cutting rights in publicly owned timber. Already private logging operations are being viewed critically by the public agencies, and the industry is engaging foresters to keep its forest practices in order. Because of the complicated interlocking ownership pattern of forest lands, these industrial foresters must cooperate with, and receive the cooperation of, public foresters. This fact forces reconciliation of the extreme points of view formerly held by those who were labeled respectively "loggers" or "foresters." It is recognized now that inevitably there will be a good deal more logging in the public forests, and that more forestry must be practiced in industrial logging operations.

The practical implementation of this fact is found in the Tree Farm program, the vehicle through which lumbermen are now practicing forestry. The Tree Farm policy of operation is described as follows:

in 1941 forward-looking timber owners in the Pacific Northwest felt that there should be some clear-cut way of showing to all and sundry the extent to which commercial forest lands are actually under management on a "timber-cropping" rather than a "cut-out-and-get-out" basis. They adopted the term Tree Farm as a ready means of identifying to the public, areas which are being retained in commercial ownership for growing timber.⁷

⁶E. H. McDaniels, *A Decade of Progress in Douglas Fir Forestry* (Seattle: Joint Committee on Forest Conservation, 1943) p. 56.

⁷*West Coast Tree Farms* (Seattle: Joint Committee on Forest Conservation, 1943) p. 4.

The realization of these promises must rest upon sound forest management principles applied by industrial foresters. The public statement of these aims is the most important acknowledgment yet made of the trend toward forest management by industry. This trend was recognized by the editor of the *Journal of Forestry* in the following statement:

anyone who is ready and willing to consider the forest industries from a fair and unprejudiced point of view must come to the inescapable conclusion that the progress of the forest industries in better forest practices during the past 25 years is truly impressive. There is, to be sure, much more to be done, far more progress to be made than has been made, but the forest industries are entitled to receive full credit for what they have accomplished.

It is difficult accurately to appraise the real status of forest management in the forest industries. If one were looking for the best examples of good forest practice in the United States, one would probably find that these examples would be found on privately owned land quite as often as on publicly owned land.⁸

This declaration from an unbiased observer emphasizes the progress of industrial forestry toward effective resource utilization. It thereby points up opportunities for industrial forest managers, and the obligation of schools of forestry to educate these managers. It will not suffice now to provide a curriculum limited solely to the social emphasis of public forestry.

A number of examples⁹ of the rapid changes now taking place in the forest industry could be cited, such as the sponsorship of state forestry legislation, the industry's tree nursery, and tree planting programs. These all illustrate the fact that forest management is now an important phase of the logging industry. It is obvious that the practice of timber cropping by the industry now requires the consideration of industrial forestry problems in the forest management curriculum.

The discussion of trends has thus far been concerned chiefly with the great transition in industrial forestry from timber mining to timber cropping. This trend is of the utmost significance to forestry education because it challenges the processes of the forestry school.

Another trend in industrial forestry emphasizes industry's concern with education.¹⁰ Some of the large companies are now planning a coordinated program of experience and education to develop picked men for potential industrial leadership. At Oregon State College the plan is already under

⁸Henry Schmitz, "The Forest Industries Ask for a Vote of Confidence," *Journal of Forestry*, XXXIX (October, 1941) p. 816.

⁹One of the most interesting is a comparison of programs of the annual logging conferences. Even ten years ago loggers gave forestry little or no place on the agenda. Today, forestry occupies a prominent place on the programs of logging conferences.

¹⁰This discussion summarizes papers on industrial forestry training prepared by the writer at the request of the Pacific Logging Congress for presentation at the 1946 annual meeting at Banff, Alberta, and the 1947 meeting at Portland, Oregon.

way in cooperation with three of the largest organizations in the forest industry. Men who are recommended by the School of Forestry are placed in various operating units of the companies for periods ranging from one summer to one year at a time. The personnel program of the School is involved, first in selecting the man, second, in supervising his actual on-job performance, and third, in correlating his field experience with education on the campus.

This last point is of significance in curriculum revision. Men who work in the logging camps will come back to school with more certain knowledge of the course work needed to advance forestry, and themselves, in their chosen field. They will not find all the essentials for the competent practice of industrial forest management in a civil service curriculum. In justice to the industrial forester, the forest management curriculum should be broadened to give greater consideration to his problems. This need not be done by adding many new courses. It is preferable instead to change the emphases in existing public forestry courses to include consideration of industrial forestry as well. The time has come when an increasing amount of industrial forestry must take place on public forest lands; hence the public forester will also benefit from an increased knowledge of industrial forestry.

The industrial forestry aspects of a curriculum in forest management will be affected not only by trends in industrial forestry, but also by the practices currently employed. Hence an analysis of the work of industrial foresters was made to secure background for the following section of this study.

ANALYSIS OF CURRENT INDUSTRIAL FOREST MANAGEMENT PRACTICES

In the early days, the industrial forester was chiefly an appraiser, making inventories of the quantity of timber and the value of forest properties, measuring timberland, and establishing boundaries. The work was originally done on a part-time basis, from which there gradually evolved a year-around position as fire-fighter in summer and appraiser in winter. Next, the industrial forester was given the cutover lands to rehabilitate after logging, and tree planting became an important part of his work. Today, the chief responsibility of the industrial forester should be participation in long-range planning for sustained forest production. The major components in the planning are: management of different species for the highest possible quality and quantity of wood-stuffs; the highest possible utilization of all materials produced on company lands, prior planning of operations to assure a maximum natural regeneration of the forest; and protection of the growing forest to make sustained yield a reality.

Over a five-year period, 1941-1946, the writer conducted an analysis of the work of industrial foresters. The task was facilitated by a three-year term as assistant state forester of Oregon, supervising industrial forest practices in the state. Over 1,000 logging operations were visited in Oregon, Washington, and British Columbia, and wherever appropriate, a survey was made of the work there being done (or which should have been done) by industrial foresters. In the following analysis only the work which was actually being performed by professional foresters is considered. The findings are based on specific analyses of the varied duties of some two hundred men currently engaged in industrial forestry.

Certain broad generalizations may be made from this survey. Some of the men had received logging engineering training, some had received technical forestry training, but none had received training specifically pointed toward the goal of industrial forest management, and some were failing because of this lack. Generally, those who had succeeded felt that they had earned it "the hard way." They felt that their education had not prepared them adequately for the realities which confronted them in industry. Three specific observations recurred so frequently that they deserve mention.

(1) The industrial foresters (and their government colleagues too) felt that they lacked an appreciation of, and a capacity for, personnel administration. They experienced difficulty in adjusting themselves as effective employees, difficulty in cooperating with skilled workers on the job, and difficulty in supervising workmen. Apparently their college training had not contributed to their success in industry as it should have, because of inadequate attention to personnel problems.

(2) The feeling among many industrial foresters was that forestry schools produced dilettantes rather than men hardened to the stern realities of forest economics. A small fraction of the publicly owned forest in America pays its own way; in consequence, some public foresters and some forest schools have fallen into the error of assuming that the cost of forest practices is unimportant. No industrial forester dare entertain such a casual attitude, for cost is the yardstick in industry. The forestry industry appreciates its social responsibilities today, but in order to discharge them it must, first of all, stay in business. Cost control is vitally important, and to appreciate this fact properly, industrial foresters need background studies in forest economics.

(3) The industrial foresters were practically unanimous in decrying forest school preoccupation with public forest management. They felt that a disproportionate share of the average curriculum was devoted to materials

of greater value to public forestry than to industrial forestry, to classic concepts of forest regulation as practiced in the public forests of Europe; and to technical minutiae archaic in origin and futile in application. They suggested instead that greater attention be given to basic regional problems in timber management, and that at least one course be devoted to the broad principles and practices under which a modern industrial forest operation must be conducted.

The analysis which follows lists the varied occupations of industrial foresters in the Pacific Northwest today. Not every man will be responsible for all of these tasks, but any industrial forester may be confronted with any of them.

Many of the activities of a company forester are regulated by individual company policy, by the tree species being harvested, by regional operating conditions, and by other individual differences. In consequence, the specific character of his work is subject to considerable modification from company to company, and from location to location. For this reason it would be futile to attempt a highly specific education in industrial forest management. Instead, the schools of forestry must provide the broad backgrounds of forest management as such, leaving it to the initiative of the graduate to continue his education in specific technical requirements after he leaves college. To do this effectively, the graduate must be willing and able to accept, and to profit from, in-service training. The school must discriminate between those facets of industrial forest management best developed on the campus and those best developed on the job. Bases for discrimination lie in the experiences of graduates and in analysis of industrial practices.

In this analysis, the courses currently given in the technical forestry department at Oregon State College and applicable to industrial forestry are listed, where appropriate. On pages 102-104 the numbers in parentheses preceding each stated job refer to these courses under the heading "Curriculum coverage" which follows each job classification. Where technical forestry courses now available do not fully meet the needs of industrial forestry, the required area of study is likewise numbered and listed under the heading "Courses needed." The number of courses so listed indicates the necessity for including considerations of industrial forestry in the management curriculum. *There would be need for more new courses than those suggested were it not for concurrent changes proposed in content and emphasis of existing courses.* Despite titles identical with or similar to the old designations of the narrow technical curriculum, it is proposed to broaden the courses themselves to emphasize managerial aspects of *both* industrial and public forestry.

Regardless of course content, course work alone will not render the graduate fully competent. Where on-the-job training is also required for effective performance of the work, the letter "J" precedes the specific occupation being considered.

JOB ANALYSIS, INDUSTRIAL FORESTER

JOB CLASSIFICATION FOREST MANAGEMENT—GENERAL

(1-10, J) Prepare sustained yield production schedules; (1-10, J) prepare basic data and recommendations on timber and land exchanges; (1, 2, 4, 6-8) recommend property for acquisition, (1, 4, 7, 9) negotiate purchases of property and stumpage, (9) secure abstracts and deeds, (9) write simple contracts and memorandum agreements, (2, 7, 8, J) prepare maps and applications for rights-of-way; (1, 4, 5, 7, 9) handle tax depletion claims, (2, 6) measure trespass, (1-3, 6-9) make cutting reports, (7-10) make time and cost studies; (2, 6, J) locate timber for special market demands; (1-8) determine cutting policy, (1-10) act as timber bargaining agent, (7, J) educate public foresters to company point of view, (7, J) recommend action where recreational areas are involved, (7, 10, 11) maintain good public relations with grange, community, service clubs, public in general, (7, 10, 11, J) explain company policy and procedures to visitors, (7, 11) represent company at industrial, professional conferences

Curriculum coverage

(1) Timber management; (2) Forest engineering; (3) Forest practices; (4) Forest valuation, (5) Forest economics, (6) Mensuration

Courses needed

(7) Industrial forest administration; (8) Logging engineering; (9) Supporting elective business courses, (10) Administration, (11) Sociology

JOB CLASSIFICATION FOREST MANAGEMENT—INVENTORY

(1, 2, 10, J) Maintain inventory of company timber, and growing stock; (1-10) gather data for determination of cutting policy, (1-10) investigate timber production potentialities in other areas for company expansion; (3, 4, 7) make type maps, (3, 4, 7, 11) make site maps, (3, 4, 7) make cover maps, (1, J) grade cruise; (1, J) check cruise; (2, 4-7) analyze value of cutover land, (4) compile statistics of land area, (1, 2, 9) keep stumpage records, (1-10) cooperate with public forest agencies in analysis of timber for purchase

Curriculum coverage

(1) Mensuration, (2) Timber management; (3) Forest practices, (4) Forest engineering, (5) Forest economics, (6) Forest valuation; (7) Forestation, new emphasis, (8) Logging methods

Courses needed

(9) Logging engineering, (10) Industrial forest management; (11) Forest soils

JOB CLASSIFICATION FOREST MANAGEMENT—RESEARCH

(1, 10) Make growth and yield studies, (1) make volume tables; (1, 2) make windfall studies in partially cut areas, (1-4) make utilization studies, including salvage, thinning, values of inferior species, grade recovery in defective timber, (1-4) study log size and quality from different areas, and production by grade from different classes of timber, (1) establish conversion factors; (1, 7) study cutting in insect infested timber, (1, 2, 5, 6) weigh partial cutting versus complete harvesting of different age classes, (1, 2, 6, 10) determine site quality in

local areas; (2, 4, 5, 7, 8) determine economics of different logging methods with reference to natural regeneration, (2, 6) study regeneration from different types of seed source; (2, 6, 7, 8) weigh artificial versus natural reproduction, costs and effectiveness, (6, 10) study plantation survival, (1-9, 11) make financial analyses of rotation periods

Curriculum coverage

(1) Mensuration, (2) Forest practices, (3) Wood utilization courses, (4) Forest valuation, (5) Forest economics; (6) Forestation (new emphasis)

Courses needed

(7) Forest protection, (8) Logging engineering; (9) Industrial forest administration, (10) Forest soils; (11) Supporting elective business courses

JOB CLASSIFICATION REFORESTATION

(3, 5, 6, J) Make land examination to determine restocking needs, (1, 3, 5) map cutover lands for planting or seeding areas, (2, 3, 4) establish reforestation priorities, (3) supervise actual work of reforestation, including arranging for planting stock or seed, transportation to planting site, training and supervision of crew, protection against rodent damage, control of costs, (3, 5) establish experimental plantings

Curriculum coverage

(1) Forest engineering, (2) Forest practices, (3) Forestation

Courses needed

(4) Logging engineering; (5) Forest soils; (6) Aerial photo interpretation^u

JOB CLASSIFICATION FOREST PRACTICES

(1, 2, 4, 5, 7, 8, J) Apply standards to secure and maintain Tree Farm certification, (1-8, J) make cutting contracts, (1-8) facilitate sustained yield procedures; (1, 2, 7, 8, J) plan compliance with state conservation act and timber sale requirements of public forest agencies, (1, 7, 8) analyze stands for most effective provision of seed source, (1, 2, 7, 8) reserve young timber, (1-4, 7, 8) conserve reproduction, (1, 7, 8, J) lay out selective cuttings and clear cut areas, (1, 2, 7, 8, J) assist logging superintendent in selecting settings; (1, J) mark timber to be cut; (2) make aerial survey of wind, insect, and fire losses, (1, J) mark and supervise thinnings; (1, 2, 5, 6, 8) interpret timber sale agreements, (1, 7, 8, J) arbitrate with government foresters where sale clauses are not practicable or economical; (1, 3, 7, 8, J) develop more complete utilization on cutover areas

Curriculum coverage

(1) Forest practices; (2) Forest engineering, (3) Wood utilization courses

Courses needed

(4) Forest protection, (5) Fire control, (6) Supporting elective business courses, (7) Logging engineering; (8) Industrial forest management

JOB CLASSIFICATION FIRE CONTROL^u

(3-4, J) Make analysis of adequate protection on operation, (4, J) pre-plan suppression, make fire plan; (1, 4, J) make protection maps, including travel time, hazards, risks, fuels; (J) build protective fire trails; (J) build water holes, (J) establish tool caches; (6, J) order fire equipment; (J) supervise maintenance of fire equipment; (4, 5, 6, J) inspect fire protection facilities, (4, 5, 8)

^uThe most effective employment of an industrial forester will result if his participation in fire control is limited to planning and supervision. The execution of the plans and the actual fire fighting should be delegated to a subordinate fire warden

organize and train crews for fire suppression; (4) maintain weather station; (4, J) close camp in bad fire weather; (2-4, J) analyze slash, make slash disposal plan; (2-4, J) burn slash, (3, 4, J) check logging equipment for compliance with state forest fire code, (4, 5, 8) make public, community, grange contacts on fire prevention; (4, 5, 8, J) educate woods crews in fire consciousness; (4-7, J) investigate fire fighting devices; (6, J) operate fire equipment; (4, J) fight fire

Curriculum coverage

(1) Forest engineering, (2) Forest practices

Courses needed

(3) Forest protection; (4) Fire control; (5) Industrial forest management; (6) Heat engines, (7) Logging engineering; (8) Administration

JOB CLASSIFICATION ENGINEERING

(1, 3, J) locate and construct fire roads;¹² (1, 3-5, J) lay out cuts, fills, bridges, culverts, (1, 4, J) maintain roads, (1) establish survey corners, (1, J) serve as axeman, levelman, chainman, compassman, transitman; (1) run boundary lines and establish legal descriptions of property; (1-3, 5, 7) prepare logging maps, (1, 4, 6, 7) maintain cutting progress maps, (1) file and maintain all maps, (1, 6) make topographic maps; (1) make maps from aerial photographs; (6) do necessary drafting

Curriculum coverage

(1) Forest engineering; (2) Forest practices

Courses needed

(3) Fire control; (4) Logging engineering, (5) Forest soils; (6) Engineering drawing; (7) Aerial photo interpretation.

JOB CLASSIFICATION OPERATIONS

(1, 3-6, J) Supervise cutting contracts; (1, J) scale logs in woods; (1, J) check scale; (1) figure scale for payroll; (1, J) make production scale to determine quantity and quality of logs per logging unit; (1-6, J) plan portable salvage mill, supervise recovery, (2, J) handle by-products sales, (1-4, 6, 7, J) supervise contractor on salvage logging jobs; (3, 4, 6, 7, J) supervise cutting crews; (3, 6) supervise farm woodlot sales; (J) keep time of forestry crews; (3-6) supervise time and cost distribution by projects, (3-7, J) cooperate with logging superintendent in long-time logging plans, integrating logging methods with economical forest practices

Curriculum coverage

(1) Mensuration; (2) Wood utilization courses; (3) Forest practices

Courses needed

(4) Logging engineering, (5) Supporting elective business courses; (6) Industrial forest management; (7) Administration

The above analysis lends direction to curriculum considerations affecting industrial forestry. Before proposing actual courses, however, this important qualification must be considered a large number of industrial forestry tasks are more properly the province of on-job training than of formal edu-

¹²The survey, construction, and maintenance of log-hauling roads is the province of the logging engineer or superintendent; the forester is responsible only for the conversion of abandoned logging roads to protection roads, and for construction and maintenance of roads primarily for fire control purposes

cation. To make the most of this training, the potential industrial forester must be well educated in fundamentals. In this connection, Fritz says.

I believe that it is far more important to get well trained and well educated men into private lumber company employ in any capacity and to hope they will retain their forestry ideals as they reach higher positions, than it is to train them as specialists¹³

For several years the Pacific Logging Congress has been concerned with correlating on-job training and campus training of college men. The quotation below is taken from a report of the Apprentice Training Committee of the Logging Congress. The committee chairman speaks of forestry school training responsibilities in these terms

The forestry school faculties have and should accept as their responsibility (1) providing curricula designed for men preferring private to public employment and arranged to give a thorough fundamental training in those sciences and arts a logger must draw upon—physics, mathematics, engineering, forestry and business economics; (2) inculcating in their students patience, a spirit of cooperation, and an attitude of mind friendly toward private enterprise; (3) improving their own understanding of the industry's problems; (4) maintaining contact with the industry, (5) acquainting their students with the kinds of jobs available in the logging industry, as well as the duties and compensations, (6) recommending men frankly and honestly for what they are worth; (7) maintaining contact with the progress of their graduates, (8) encouraging students to seek and helping them to obtain summer vacation employment in the woods¹⁴

The above statement by Professor Fritz is accepted as authoritative by the west coast forest industry and the forestry schools of the region. Its precepts apply to the industrial phases of the proposed forest management program at Oregon State College. Referring to the numbers in the quotation above: (1) the new curriculum would include among other subjects, "physics, mathematics, engineering, forestry, and business economics;" (2) staff members should be recruited from industry to strengthen the industrial aspects of the program, and specific attention to industrial forestry is contemplated; coverage of industrial as well as public forestry opportunity is already offered in the newly-established orientation course, (3, 4) such a faculty should be competent to serve in a consulting and advisory capacity to industry, and thus be familiar with industrial problems, staff members should be frequent participants in industrial conference programs; and (5) employment survey, (6) analysis of student employability, (7) graduate follow-up,

¹³Letter from Prof. Emanuel Fritz, Consulting Forester, The Redwood Association, August, 1946

¹⁴Emanuel Fritz, "Industrial Training for Forestry Graduates," *Journal of Forestry*, XXIX (March, 1941) p. 17

(8) seasonal supervision, all would be veritable cornerstones of the personnel program previously described. In conclusion, Fritz says.

Specialization in particular fields of forestry and lumbering is less important than offering a broad base of fundamentals. The curriculum should of course be kept up to date with industrial changes¹⁵

SUMMARY

In recapitulation, the chief factors affecting industrial forestry phases of forest management education are

(1) The practice of forestry by industry

Forest management is now operative on private lands as well as public. The courses shown to be required for effective industrial forest management are provided in the proposed curriculum. Their purposes would be implemented by the method of presentation which comprehends both approaches to management.

(2) Industrial self-regulation

A major facet of the proposed program would be the development of an appreciation of the responsibilities of industry in resource management. These concepts would be specifically included in the courses in Orientation, Forest Land Use, Forest Management, Industrial Forest Administration, and Forest Economics.

(3) Education and job-training are both required.

Competence in some of the tasks of an industrial forester logically should be developed on the job. A number of his responsibilities, however, require attitudes, appreciations, facts, and procedures which may be acquired in college. These two types of tasks have been carefully analyzed in the survey reported above. The proposed program does include coverage in those areas which should be the responsibility of the School of Forestry. The changed emphasis which results is for the purpose of bringing the work in management "up to date with industrial changes," as Fritz suggests.

With the above factors in mind, and with consideration of those that bear upon public forest management, a basic curriculum in forest management was worked out to provide a joint appreciation of what are essentially similar problems. The differences which do exist between the two types of management are these: public forestry is chiefly a social, national concern, while industrial forestry is chiefly an economic, local concern. These differences may be recognized by providing for appropriate elective courses most useful to the individual forester.

¹⁵*Ibid*

Chapter 13

A PROPOSED FOREST MANAGEMENT CURRICULUM TO SERVE BOTH PUBLIC AND INDUSTRIAL FORESTRY

The analyses of trends and practices in public and industrial forestry show clearly that forestry in 1947 differs from the forestry practiced even as late as 1940. A curriculum adapted to the new requirements in forest management education is proposed below. The technical forestry curriculum in 1940 was representative of forestry education during the years described as "the period of increasing attention to forestry." In 1941 a few changes were introduced on the recommendation of the writer, anticipating the program suggested here. The need for further changes was recognized in 1941, and the program below has evolved from that recognition. The burgeoning of all forest management activities during the war years has resulted in a substantial advance toward more effective forestry. This makes mandatory a new program in forestry education to meet the new requirements of "the period of action" in forest management in Oregon.

For purposes of comparison, the programs in force in 1940, and proposed for 1947, are presented below. The whole of the difference between the two programs is not discernible from titles alone; there are greater differences (1) in intent; (2) in diversion of emphasis from techniques to

PROPOSED FOREST MANAGEMENT CURRICULUM, COMPARED WITH PREWAR CURRICULUM IN TECHNICAL FORESTRY FRESHMAN YEAR

<i>Technical Forestry Curriculum 1940</i>		<i>Forest Management Curriculum 1947</i>	
	<i>Credits</i>		<i>Credits</i>
(1) General Forestry	4	General Forestry	2
(2) Forest Protection	4	Orientation	2
Tree Identification	4	Tree Identification	3
Surveying	3	(5) Forest Engineering	3
(3) Botany	6	(3) Biology	3
(4) Mathematics	12	(3) Chemistry	3
English Composition	9	Geology	3
Military	3	Mathematics	12
Hygiene	2	(6) English Composition	9
Physical Education	2	Engineering Drawing	3
—	—	(7) Military	6
49		Hygiene	1
		Physical Education ...	2
		—	—
		52	

administration; and (3) in method. It is not possible to show these distinctions on paper, except in part by intensive review of all course content. Proposed individual courses and methods have been reviewed in detail by men who are competent to judge them, and the proposals have the endorsement of these forestry leaders.

Notes

- (1) General forestry in 1940 attempted to give a brief overview of each forestry course, a needless duplication of later course work. It should be replaced by a new general course dealing with the history and development of forestry; and by orientation, dealing with personal adjustments in forestry.
- (2) Forest protection attempted to duplicate the mechanics of fire fighting as taught by in-service training at guard school. Fire fighting methods may be taught much more effectively by on-job training, and discontinuance of the course was approved by forest protection agencies.
- (3) Botany would be changed to the sophomore year, to be replaced in the freshman year by three general culture courses, including an overview of phases of biology and chemistry as they affect modern living and an appreciation of the geological environment. The change should be made in recognition of the large numbers of men who receive only this one year of college education—and of botany as a pre-technical subject, lacking the general educational purposes which characterize the courses proposed to substitute for it.
- (4) Mathematics in 1940 consisted of courses narrowly specialized for foresters. Upon recommendation of the mathematics department, they should be replaced by the standard sequence in elementary analysis, to be preceded by such remedial work as a deficient student might require.
- (5) Previously existing duplication between freshman engineering and sophomore engineering would be eliminated in this curriculum.
- (6) Reading comprehension and vocabulary tests should be given freshmen, and those in need of remedial work, in addition to those who do not maintain a "C" average in English, should be required to take further work in this subject.
- (7) Military credits were increased by the War Department in 1946.

SOPHOMORE YEAR

<i>Technical Forestry Curriculum 1940</i>		<i>Forest Management Curriculum 1947</i>	
	<i>Credits</i>		<i>Credits</i>
Mensuration Scaling ..	4	Mensuration Scaling and	
Mensuration Cruising ..	4	Cruising ..	5
Mensuration Growth ..	4	(2) Forest Engineering ..	4
Forest Engineering ..	15	Physics ..	6
Physics ..	6	Wood Utilization ..	3
(1) Chemistry ..	3	Economics ..	3
Economics ..	3	(3) Forest Protection ..	3
National Government ..	4	Botany ..	6
State and Local Government ..	4	(4) Government ..	6
Military Science ..	3	Literature ..	3
Physical Education ..	3	Speech ..	3
	53	Soils ..	3
		Military Science ..	6
		Physical Education ..	3
			54

- (1) In the earlier curriculum, an attempt was made to survey chemistry in one three-hour lecture course for foresters. It was impossible to accomplish such an objective and the course should be supplanted by "chemistry appreciation" in the freshman year.
- (2) The first term of sophomore forest engineering was reduced in credit and made a basic survey course for all students in the School in 1946, in anticipation of the further change suggested here. The remainder of the engineering, after extraction of the drawing, should be consolidated and placed in the junior year.
- (3) A new course in protection should include all the inimical factors against which the forest must be protected, including fires, diseases, infestations, climatic and other types of damage, and salvage of loss. The appreciation of these factors is essential to competent forest management, industrial as well as public.
- (4) In 1940 government courses were in the curriculum but were not required; any social science was accepted in substitute. In 1947, the increasingly important relationships of the citizen to his government makes mandatory an appreciation of governmental process. For this reason government courses should be required without exception.

JUNIOR YEAR

<i>Technical Forestry Curriculum 1940</i>		<i>*Forest Management Curriculum 1947</i>	
	<i>Credits</i>		<i>Credits</i>
Identification of Wood	4	Technical Report Writing	3
Wood Utilization	4	Forest Land Use	3
Dendrology	4	Wood Utilization	3
Logging Methods	3	Growth of Timber	4
Forest Ecology	4	(1) Logging Methods	3
Forest Practices	4	Forest Ecology	4
Seeding and Planting	4	Forest Practices	4
Accounting	3	(2) Forestation	4
Range and Pasture Botany	3	Range Management	3
Speech	3	Forest Valuation	3
Electives	15	Literature	3
	51	(3) Seminar	1
		Forest Engineering	4
		Electives	9
			51

Notes

- (1) This course covers regional logging methods, fulfilling one of the civil service examination requirements.
- (2) A relic from the early days of forestry was the nursery-work course in seeding and planting, reflecting an Arbor Day-type of interest in planting trees. Much more important today is the appraisal of cutover lands for rehabilitation, and the integration of forest reproduction methods with forest practices. This is the major content of the new course in forestation.
- (3) The School of Forestry requires a senior paper of every student as a prerequisite to graduation. In order that time and thought may be given to the prepara-

* With the exception of the service course in literature, every course here listed would be changed in content, emphasis, and method, to agree with the principle of stressing management rather than techniques alone.

tion of the paper prior to the senior year, one hour of seminar should be scheduled for the spring term of the junior year. This is an opportunity to develop the application of technical report writing in collaboration with the English Department.

SENIOR YEAR

Technical Forestry Curriculum 1940

	<i>Credits</i>
Forest Finance	8
Forest Economics	4
Wood Properties	4
Forest Recreation	3
Forest Plans	3
Forest Land Use	3
Forest Laws	3
Forest Control	3
Seminar	3
Electives	17
	51

**Forest Management Curriculum 1947*

	<i>Credits</i>
(1) Logging Engineering	5
(2) Forest Management	3
Forest Economics	3
Dendrology	3
(3) Industrial Forest Adminis- tration	3
Timber Management	5
(4) Forest Administration	3
(5) Fire Control	3
(6) Sociology	3
Seminar	2
Literature	3
Aerial Photo Interpretation	3
Electives	12
	51

Notes

- (1) This is a basic course in industrial logging methods now taken only by logging engineers. It should also be taken by industrial and public forest managers, to give them an appreciation of the logging principles and problems with which they must deal in timber management.
- (2) The old concern of public forestry, chiefly with timber, has now become a concern with multiple use of the forest. This should be an overview course, integrating all the values of the forest—recreation, forage, wildlife, and watershed, as well as timber. The content is essential for current public forest management practice, and should precede the specialization in timber management.
- (3) The lumber industry is the mainstay of Oregon's industrial economy, and about 85 per cent of lumbering operations are found on privately owned land. This fact requires that attention be given to the problems of private forest operations. A course of this nature will become increasingly important to public foresters as logging operators in greater and greater numbers move into public forests.
- (4) Forestry graduates, as potential leaders in their profession, should have some understandings of personnel relationships. This course should deal with the personnel factors peculiar to forestry employment. Personnel chiefs of the United States Forest Service in the Pacific Northwest and Alaska regions suggested the content, and for two years worked closely with the writer in formulating the course. Industrial foresters were unanimous in demanding inclusion of this type of course in the curriculum.
- (5) The course in fire control should comprehend analysis of administration on large fires, fire planning surveys, and region-wide co-ordination of control efforts.
- (6) The forest manager will be required to exercise a high degree of social responsibility. He must work with and for the public, and should have some understanding of sociology for this purpose.

* The emphasis again is on managerial aspects rather than technical skills.

The program presented here would aim to further the development of the *whole* student, not just the technician. This requires daily attention to the personal and social development of the individual and the citizen as well as to professional advancement. Hence, course work and personnel work must be inseparable in the program; courses alone are but partial contributors to the ultimate goal of a school of forestry.

The limitations imposed by various fixed requirements make it impossible to attain all the goals of an ideal curriculum. The lower division courses proposed are intended to contribute as much as possible to the goal of general education; while the upper division courses are intended to produce not narrow specialists, but intellectually developed students. To satisfy technical requirements, the courses set forth here also (1) meet the specifications of civil service examinations, (2) include considerations shown to be necessary by the analyses of public and industrial forest practices; and (3) attempt to anticipate trends in public and industrial forest management which will affect forest management education.

The proposed curriculum is framed within the educational philosophies of the Oregon State System of Higher Education, Oregon State College, and its School of Forestry. It is endorsed by the staff of the School of Forestry and the Society of American Foresters (which accredits schools of forestry), and in final form, it results from constant reference to the standards of the above-named agencies.

There are two chief distinctions between the 1940 curriculum and that proposed for 1947. First, the number of narrowly specialized forestry courses has been reduced in favor of general education; for example, forest laws, forest finance, and forest policy are dropped, and courses such as biology, geology, and sociology are added. In addition to the changed course requirements, the forestry courses intrinsically would be broadened to give increased scope to student development, examples are new liberal emphases in forest protection, in forest land use, and in forest administration. Second, the curriculum in technical forestry was concerned with the techniques of public forestry; now the forest management curriculum would be concerned with the *management* of both private and public forests. An example is the addition of a course in industrial forest administration. To illustrate further, the timber management courses were formerly restricted to classic, theoretical applications to public forests; now the consolidated timber management course would be concerned with workable principles of managing both public and industrial forest properties. Each professional course would be modified in the same way to present both facets of management. This is a particu-

larly significant change in view of the current close integration of public and private interests in the sustained yield forest units now being established.

A minor in industrial forest management would be added to permit students interested in industry to take more business courses as electives. The fundamental difference between public and private forestry, as noted previously, is a difference in the application of economics to the forest. The basic physical objective of both is the same, namely, to keep forest lands productive. To this end, the basic education of public and private foresters should be the same insofar as it deals with physical factors of the forest. The provision of a minor in industrial forestry will permit the industrial forester to add such courses as are unique to his requirements. Additional minors available for specialization by the public forester are range management, recreation, wildlife management, soil conservation, and others.

The Society of American Foresters holds that the professional forester needs a background both of general education, and of principles and practices of forestry. The Society expects the forestry schools not only to provide the minor skills essential to successful apprenticeship, but to develop the attitudes, appreciations, and abilities necessary in later administrative and perhaps creative work. It recommends that deficiencies in general education in forestry schools be corrected so that undergraduate forestry will provide at least the equivalent of two years of general education. Distribution of the studies in a four year course is suggested as follows: general education subjects, 43 per cent; pretechnical subjects, 23 per cent; and technical subjects, 34 per cent. The general education group includes:

the work in science, mathematics, and economics essential as a foundation for later work in forestry, and also certain humanistic subjects which are designed to strengthen and broaden the student's general educational background. The pre-technical group includes special work in science, mathematics, and engineering immediately introductory to the technical studies. The technical group comprises the subjects of professional character and scope.¹

Differences of opinion in classification of courses into these three groups will result in different percentage allocations of courses in every school. The table following shows the approximate distribution of general, pretechnical, and technical subjects as defined by Graves and Guise in the proposed forest management curriculum for the School of Forestry at Oregon State College.

The percentages in both cases are expressed in terms of the total *required* courses. Graves and Guise permit only restricted electives, in the general education field, and shown as a part of the general education total. The curriculum proposed here allows a larger percentage of general education in

¹Graves and Guise, *op cit*, p. 117

terms of required courses, and in addition permits about thirteen per cent of free electives.² The electives are not shown in the table below, and as in the Graves and Guise curriculum, military science and physical education are also omitted.

PERCENTAGES OF REQUIRED COURSE HOURS³

Subject fields	Technical forestry 1940	Forest management 1947	Graves & Guise curriculum
General Education	36	46	43
Pretechnical Education	15	20	23
Technical Education	49	34	34

The era of forest "conservation" has passed, and the era of effective forest utilization is at hand. This poses problems of such magnitude that they cannot be solved by trial and error or by wishful thinking; they will yield only to the persistent application of clear thinking by foresters who are educated to cope with present needs and future developments in the professional fields.

This monograph has attempted to analyze the factors influencing forest management in Oregon today and to draw from them implications for the personal and professional development of students in forest management.

²Superficially it appears that fewer electives are proposed for 1947 than were available in 1940. Actually, courses of the type which it was hoped the students would elect in 1940 would be required by the 1947 program; nine hours each of science and of literature, for example

³Breakdown of courses as defined by Graves and Guise, and as actually taught in practice at Oregon State College.

Part IV. Conclusion

Chapter 14

SUMMARY

Early professional forestry in America was almost wholly a governmental enterprise, chiefly concerned with the techniques of measuring, identifying, classifying, and preserving public forests. Western forests at that time were remote from people and industries, and there was no integration of industrial forestry with the broad aspects of resource management. Forestry schools of the period were almost wholly concerned with the preparation of men for civil service careers, virtually the only important employment opportunities. Course offerings were generally restricted to technical forestry.

Forest management has changed appreciably from its early premises, but at Oregon State College, as elsewhere, management education has lagged behind current developments in the field. There is much more management in industrial forests today; more industry in the public forests, more recreation; and more need for foresters to be competent in societal as well as arboreal qualifications. The educational program which was in force in 1940 was not adequate for the needs of 1947. Oregon State College offered work in forest recreation; but it made no provision for industrial forest management. Before 1946 it gave little attention to the personal development of students.

Chapter 1 gives an introductory statement of the problem, showing the increasing complexity of forest management, the rise of industrial and state forestry, and the importance of personnel management in forestry. Basic data were derived from government administration manuals, from the literature, from the obvious evidence of state and industrial forestry expansion, from personal communications from authorities, and from a study of foresters' interests by Dr. E. K. Strong, Jr., of Stanford University.

Chapter 2 summarizes the development of forestry in America and its influence upon forestry education. The facts were obtained from theses on the history of American forestry, from a survey of the *Journal of Forestry*, and from colleagues and friends still living,¹ who initiated professional forestry and forestry education in America.

¹Gifford Pinchot, first Chief Forester of the United States Forest Service, was still living at the time this statement was originally written. He died in October, 1946, thus closing the chapter on the initiation of professional forestry by the Government of the United States.

Chapter 3 chronicles the evolution of forest management in Oregon and its relationship to forestry education in the state. Facts were derived from personal research (published by the Oregon State College Press in the bulletin *Forest Resources in Oregon*), from the literature, and from personal acquaintance with the men who have participated in Oregon forestry in the last forty years.²

Chapter 4 recognizes that forestry education in Oregon is subject to the broad educational philosophies of the State Board of Higher Education and Oregon State College. Statements of these philosophies were obtained from the respective principals, and were used as guides in formulation of the forestry program

Chapters 5-8 outline a proposed personnel system as an integral part of the educational program in the School of Forestry. It was based upon research in forestry personnel files, and upon a series of interviews with professional foresters and forestry employers over a six-year period. Foresters in general, and forestry personnel managers in particular, strongly believe the personal development is as important a school process as the technical development of prospective foresters.

The suggested personnel procedures are based upon the needs indicated by graduates of the school; upon several years of close cooperation with industrial and Forest Service personnel chiefs,³ upon supervision of a professional forestry employment program for ten years; upon three years of forestry personnel administration; upon interviews with several hundred foresters; upon follow-up of many forestry graduates, and upon consulting forestry personnel work for industrial forestry agencies

The personnel proposals have been approved by authorities competent to make the judgment, personnel chiefs for state and federal forestry departments, and chief foresters for the largest industrial forestry organizations. The personnel work of the School is closely tied in with the personnel programs of these major employing agencies. It is also carefully integrated with the new curriculum proposals. *This is the most significant phase of the study*, for either a good personnel program or a good instructional program could fail, alone. *The incorporation of personnel procedures with classwork*

²One of these acquaintances was Marvin Nye, keeper of the toll gate on the Santiam Wagon Road. He was the first man to organize a crew to fight forest fires on privately owned land in Oregon, in 1904. Nye died in 1944, the beginning of forest management in Oregon is still that close.

³This cooperation now includes attendance of the head counselor of the School of Forestry at the Forest Service personnel management training school. The training course itself relies upon the School of Forestry to furnish its graduates with the basic considerations in forestry personnel relationships.

is the heart of the whole educational program To assure unity of purpose in both course work and personnel work, the men who teach the courses now also serve as personal counselors.

Chapters 9-12 analyze trends in forest management and current management practices in Oregon. Data on trends were obtained from personal experience as assistant state forester of Oregon, from active participation in the very changes indicated as they took place, from analyses of confidential data concerning public and industrial forestry, from the extensive literature, and from conferences on the subject all over the Pacific Northwest. Data on current practices in public forest management were obtained from interviews with public foresters and from the authoritative work load analysis just completed by the United States Forest Service. Data on current practices in industrial forest management were obtained from interviews and from a five-year study of those practices by the writer. The educational conclusions derived from the findings were approved by public and industrial forestry authorities.

Chapter 13 presents an analysis of the courses offered in technical forestry in 1940, and of those proposed for forest management in 1947. The essential difference is in the present emphasis upon the development of administrative potential rather than the development of professional techniques. General education would be stressed in the first two years, professional responsibility in the last two years.

One of the most thoughtful analyses of American forestry education in recent years was undertaken in 1946 by a group of foresters teaching in an Army college in France. They had no vested interest to serve, their views were all tempered by several years of postgraduate experience, and they were able to look back upon the American scene dispassionately. As a result they produced the following clear statement on forestry education:

Briefly, we find the following weaknesses to be most apparent in the forestry training now given in our schools

- (1) Lack of a sufficiently broad educational background in the forestry curricula
- (2) Too much poor instruction and too many poor instruction methods
- (3) Insufficient attempt to obtain the highest caliber students in the forestry field and insufficient weeding out of misfits
- (4) Poor student counseling service
- (5) Inadequate development and utilization of on-the-job training programs
- (6) Limited use of field trips
- (7) Over-emphasis on civil service examinations⁴

⁴Bagley, *op cit*, p. 173

Using these points as a yardstick against the proposals offered in this monograph:

(1) The general education content, even though expanded considerably over that of the previous curriculum, is probably still less than is desirable. Limiting factors of civil service examinations and industrial requirements still apply. Curricula must conform to professional requirements if Oregon students are to compete successfully with students from other states.

(2) The quality of instruction is presumed to lie outside the province of the study.

(3) Men of highest caliber will be attracted if the purposes of the forestry school are worthy. The objective of the proposed program, to enhance the self-development of the student to his ultimate capacity, is a purpose which should attract good men.

(4) The authorities consulted believe that the effective application of the personnel procedures suggested here will provide adequate counseling.

(5) The new personnel system in the School of Forestry already includes an effective on-job-training program. In collaboration with several industrial associations the work is now being expanded to take in more companies and wider fields.

(6) Many of the proposed courses would use field trips extensively. Trips from one day to a week in length would characterize instruction in those subject fields where campus facilities are inadequate.

(7) The great expansion in industrial forestry has been recognized by increasing the courses in this field, and the criticism of "over-emphasis on civil service examinations" should not apply. At the same time, the program includes improvement in the education of men destined for public employment, as well as for those with industrial objectives.

The basic purposes of the program are to enhance the self-development of the individual and the citizen; to aid management students in developing an intelligent appreciation of both industrial and public forestry; and hence through broader understanding, to unite, rather than to divide foresters.

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APPENDIX

The form on the opposite page is a facsimile of a temporary form filled in by the new student on registration day. His biographical data are typed on the similar Form A (following page) and this sheet is discarded. Recent employers listed by the student are asked for a report on his work prior to college, if it seems significant.

Form A on the opposite page is the basic personnel form maintained in the student's file during college and after graduation. Test scores are added from placement examinations. The adviser's annual summary, a numerical rating with explanatory note, is entered each spring in conference when all staff members rate the students. A digest of employment prior to college is entered on the reverse of the form, as well as summaries of seasonal work and campus activities. From these items is derived an overall summary of the student's ability which serves as a guide in placing him after graduation.

PERSONNEL RECORD SCHOOL OF FORESTRY OREGON STATE COLLEGE

Name		Last	First	Middle	Major	Race	Nationality	Date	Married Date	Transfer from	Number of children	Religion	
Permanent Address													
College Social Fraternity or Club		Lodge Affiliations			Other Organizations								
H. S. last Attended		Location											
Names of Parents or guardians		Place of Birth	U S Citizen	Education Degree	College	Occupation	Address						
Health		Height	Weight	Disabilities									
Personal interests, hobbies													
Forestry objective logging products management why?													
Forestry contacts, background													
Special abilities													
Veteran		Period of service, from	to		Grade when discharged								
Theaters of operation		Special training received?											
Awards, citations, etc.													
Test Scores	ACE decile	Ling	Quan	Gross	Math Place	Eng Place	Read & Vocab						
	GPA	Strong's USFS	Strong's Ind For	For Apt	H S Decile	Civ Serv Rating							
Advisers annual summary													
Date	Staff ranking	Date	Staff ranking	Date	Staff ranking	Date	Staff ranking						

Freshman Photo

Employment Prior to College. Employer, kind of job, pay, etc.	Seasonal Work Record while in College. Employer, length of experience, kind of job, pay, brief comment on performance, etc.
Summary of student's ability from employer reports and staff ratings.	College activities, offices held, awards, honoraries.

SCHOOL OF FORESTRY, OREGON STATE COLLEGE

ADVISER'S RECORD OF STUDENT CONFERENCE

STUDENT'S NAME

Note registration recommendations; difficulties encountered; accomplishments; academic deficiencies and their remedy

Term 1

4

Adviser

Date

2

Adviser

Date

5

Form F provides a continuous record of student conferences throughout the normal college career of 12 terms. This serves as a guide in subsequent conferences, as a check-list for items in the student's program requiring attention. Upon graduation, any significant items are typed on Form A and this sheet is discarded.

Adviser

Date

3

Adviser

Date

6

Adviser

Date

Adviser

Date

The Student Objective form is used to inspire some solid thinking about a career. No student is ever held to whatever original objective he may indicate, and some men do not know what their objective may be on entering the School. The necessity of thinking through these questions clarifies some points and raises others, which can be taken to the adviser for answer. Another purpose of this form is to make the student appreciate the difference between a professional career and the mere accumulation of credit hours in college.

SCHOOL OF FORESTRY, OREGON STATE COLLEGE

STUDENT OBJECTIVE

1 If you had absolutely free choice of occupation, what would you prefer to do upon graduation?

2 If for any reason this position does not become available, can you adapt to an alternative position?

What is it?

3 What positive steps toward accomplishment of either objective have you taken so far, and what else do you plan to do between now and graduation?

Student's Name

Date

Each January an employment convocation is held in the School of Forestry, when seasonal work opportunities and responsibilities are explained. Each student fills in the employment blank on the following page. From the preferences expressed, arrangements are made for interviews with employers who come to the campus to arrange for summer crews.

School of Forestry

To be filled in by adviser:

Agreement or disagreement with above objectives: _____

Comments useful in student placement.

Adviser's Signature

The Student Employment Record is sent to each seasonal employer of students. A digest of the returns each year is entered on the permanent record, Form A. This permits a quick review of employment to determine if the student has satisfied the six months experience requirement prior to graduation. To encourage full expression of opinion from employers, these records are never shown to the student. Personal factors requiring attention are acted upon without reference to the employers' report as the source of information.

STUDENT EMPLOYMENT RECORD

School of Forestry, Oregon State College, Corvallis, Oregon

This report is confidential: will not be shown to the student

Student's Name Date

Employed by

Address

Immediate superior Title

Report written by Title

(Signature)

Job held From to Rate of pay

Job held From to Rate of pay

Did he work satisfactorily? If yes, should he do more responsible work next year? What job
would you recommend for him?

What special capacities, if any, did the student exhibit

Should he have more training in this specialty to make him a more valuable employee?

If the student's work was unsatisfactory, was it so poor that you would not re-hire him? If so,
could you say that it was the fault of the School, the student, or the employer, and why?

If the School is at fault, what suggestions do you make?

Was the student given any training on the job? Was he fully acquainted with the requirements and
the responsibilities of his job? Number of contacts between student and his immediate superior
during summer?

Do you think the student is capable of giving satisfactory service in another type of work, forestry or
others? Under a different supervisor?

What technical or personal deficiencies of the student require correction?

Recommendations and remarks

The Graduate Personnel Report is sent out at intervals after graduation to check on each student's progress. The number of reports obtained will vary with the man, the types of work, and the number of moves made. This follow-up provides accurate information on which to base placement recommendations. It is discontinued when the man emerges from the "young forester" category and becomes permanently located.

SCHOOL OF FORESTRY, OREGON STATE COLLEGE
GRADUATE PERSONNEL REPORT

(Confidential for Dean's files only)

Date.....

Name of graduate

Employed by From To

Address

Immediate superior Title

Report written by Title

Payroll classification of employee

Kinds of work performed and salaries received

Is his work superior above average below average or mediocre in terms of the standards expected for this type of work? Comments?

Would you recommend the man for promotion in your organization, or in other fields? For what types of work do his present or potential abilities best fit him?

Does he exhibit any outstanding characteristics which might be of greater advantage to him and to an employer in work different from that which he is now doing?

If the man is not satisfactory, are his defects personal, or professional?

Was the School at fault? If so, what recommendation would you make to overcome the condition?

Other comments?

Confidential

The Graduate Personnel Report is sent out at intervals after graduation to check on each student's progress. The number of reports obtained will vary with the man, the types of work, and the number of moves made. This follow-up provides accurate information on which to base placement recommendations. It is discontinued when the man emerges from the "young forester" category and becomes permanently located.

SCHOOL OF FORESTRY, OREGON STATE COLLEGE

GRADUATE PERSONNEL REPORT

(Confidential for Dean's files only)

Date

Name of graduate

Employed by From To

Address

Immediate superior Title

Report written by Title

Payroll classification of employee

Kinds of work performed and salaries received

.

.

Is his work superior above average below average or mediocre in terms of the standards expected for this type of work? Comments?

.

Would you recommend the man for promotion in your organization, or in other fields? For what types of work do his present or potential abilities best fit him?

.

Does he exhibit any outstanding characteristics which might be of greater advantage to him and to an employer in work different from that which he is now doing?

.

If the man is not satisfactory, are his defects personal, or professional?

Was the School at fault? If so, what recommendation would you make to overcome the condition?

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Other comments?

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Confidential

The Graduate Personnel Report is sent out at intervals after graduation to check on each student's progress. The number of reports obtained will vary with the man, the types of work, and the number of moves made. This follow-up provides accurate information on which to base placement recommendations. It is discontinued when the man emerges from the "young forester" category and becomes permanently located.

SCHOOL OF FORESTRY, OREGON STATE COLLEGE
GRADUATE PERSONNEL REPORT

(Confidential for Dean's files only)

Date

Name of graduate

Employed by From To

Address

Immediate superior Title

Report written by Title

Payroll classification of employee

Kinds of work performed and salaries received

Is his work superior above average below average or mediocre in terms of the standards expected for this type of work? Comments?

Would you recommend the man for promotion in your organization, or in other fields? For what types of work do his present or potential abilities best fit him?

Does he exhibit any outstanding characteristics which might be of greater advantage to him and to an employer in work different from that which he is now doing?

If the man is not satisfactory, are his defects personal, or professional?

Was the School at fault? If so, what recommendation would you make to overcome the condition?

Other comments?

Confidential

