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— SHALL I BE AN ENGINEER? —

FORESTRY—A CAREER

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This is the fourth of a series of nine articles written at the request of Colorado Engineering Council especially for high school students who intend to become engineers.

“DON'T worry about jobs—you fellows will make your own jobs.” When Professor Filibert Roth of Michigan University said that to his hopeful young forestry students a few more than thirty years ago, there were only a hundred graduate foresters in the United States. Now there are seven thousand, and are they busy!

In 1902 the four-year-old New York State College of Forestry at Cornell had 72 student registrations; the Yale Forest School, opened in 1900, had 38 students; and there were 18 at Dr. C. A. Schenck's private forest school on the Vanderbilt estate in North Carolina. The University of Nebraska, the University of Michigan, and the Michigan Agricultural College were offering short courses in forestry, and the University of California was seriously considering the establishment of a forest school. The number of forest schools increased during the succeeding thirty years to 24 granting degrees in forestry. More than 60 other colleges now include forestry courses in their curricula.

Enrollment of students at the various forest schools broke the thousand mark in the year 1920-21. The next decade showed a gradual increase in the number of students, and during the period 1929-1934 the average annual enrollment was 2,243. It then jumped to 3,791 in '34-'35 and to 5,406 in '45-'36. In 1903 the schools conferred but one bachelor's degree in forestry, but 10, they conferred 14 master's; now they are turning out graduates in the proportion of six bachelors to one master; the total production has reached about 500 graduates per year. Professor Roth's shrewd foresight must be acknowledged, for his prophecy has made good to date. Nevertheless, the fact that there are at this moment enrolled in our forest schools nearly as many would-be foresters as there are graduate foresters earning their livelihood by the application of their learning, is sufficient to justify a young man in pausing to consider all phases of the situation before choosing forestry as his profession. First, it may be well to sketch the background for such consideration.

What is “forestry?” How broad or how restricted a field does it offer? What is its appeal? What has caused the recent rather startling increase of enrollment in forest

schools? The next obvious question is as to whether the forest school graduates of the next few years will be faced with a condition of complete employment saturation in their chosen profession or whether opportunities for satisfying activity and service will continue to expand.

Forests have been closely associated with our national life and progress for 300 years, but only within the past 30 has “forestry” become a common word with real meaning to us. Nearly one-half of our country was originally forest, and even now one-quarter of our land area is properly classed as forest land. Forestry in its essence is the growing of crops of trees. It is basically the scientific management of the forest to secure continuous maximum production of wood and other materials. In the very nature of things, however, it has come to have a broader meaning because of the great number of contingent uses to which forest lands may be put and the many benefits they bring to man, such as soil conservation and flood prevention or amelioration, production of usable water supplies for irrigation, power and domestic purposes, the providing of habitats for wildlife, ranges for domestic stock, and what is of the greatest social importance—opportunities for regular and permanent employment and outdoor recreation. Modern forestry, therefore, involves land management and land use planning. It is also vitally concerned with the utilization of wood and other forest products because of the intense competition between these and wood substitutes.

Forestry in this country has been pretty generally regarded as an activity of government because its practice was undertaken on a large scale first by the federal government, followed as the years went on by most of the states and a few municipalities. Private owners of forest land have been, for the most part, chiefly interested in selling the merchantable products and then disposing of the land. It has been difficult for the land owner with high carrying charges, risk and taxes, to interest himself in such a long-term, low-income business as the continuous production of forest crops. Because of this situation, practically the only employers of foresters during the profession's early days in this country were the federal govern-

ment and the growing forest schools. In 1912 about 60 per cent of the foresters were in government work, and fully 95 per cent had been at one time or another in their careers. From then on opportunities for employment outside the government service increased, although not as rapidly as foresters themselves would have wished. The fact that so many did find work among private employers is eloquent testimony of the ability of foresters to "make jobs." Convinced of the importance of the proper handling of our wild lands to the nation's well-being, and, in fact, very life, they have through their earnestness carried conviction to a substantial part of the people of our country. The nation is now pretty thoroughly conservation-minded and the forester is accepted as a very necessary cog in the national economy.

The onslaught of the depression affected foresters as well as those in other activities. The young graduates from the forest schools in particular faced a pretty gloomy outlook. Then President Roosevelt organized the Civilian Conservation Corps and forthwith every unemployed forester went to work. This "new deal" for foresters naturally had a quick reaction in arousing the interest of students in forestry. This was shown by the 140 per cent increased enrollment in the forest schools in 1935-36 over the previous five-year average. The CCC has now been extended for three years and, while it has shrunk in size somewhat, it will continue to need replacements in its project overhead staffs—a substantial number of whom will doubtless be foresters. The supervisory and facilitating personnel at present employed in the CCC camps doing forestry work under the general direction of the Forest Service numbers about 13,000, many of whom are graduates of forest schools. Foresters are also employed to some extent as foremen in the CCC camps operated by other agencies, such as the National Park Service.

The Forest Service will continue to offer opportunities for employment to technically trained foresters. It now has a total of about 3,300 regularly appointed personnel. Many of the older men in the service will reach retirement age within the next ten-year period. There is considerable normal turnover due to men dropping out to take teaching positions, or state or private forestry jobs; or because they are found to be unsuited to the work. All of this means need for replacements, the number of which per year it would be difficult to estimate for the future, even roughly. The work of the Forest Service falls into three classes: the management and protection of the National Forests, forest and range research, and the extension of forestry practice through cooperation with state forestry organizations and private land owners. The National Forests themselves comprise about 166 million acres of government-owned land, the great bulk of which lies in the western part of the country. Increasing acreage, however, is being added to the National Forests in the eastern forest regions, the additions reaching as many as 3 million acres during a single recent year through purchase of land.

The usual introduction for a young forestry graduate into the Forest Service is by means of the Junior Forester or Junior Range Examiner Civil Service examination. He may then go directly into research work if he is particularly fitted for that kind of work and desires it, or he may be assigned to work on the National Forests, usually as an assistant ranger or possibly in a timber cruising or range

survey party. The immediate goal of men thus assigned is usually to become a district ranger. This, in and of itself, is an excellent job for men who like it and are adapted to it, and it is likely to be the permanent job for the majority of the men entering the Forest Service in the National Forest branch. Candidates for staff positions in a Forest Supervisor's office are selected from among the district rangers. The usual line of promotion is through these staff positions to a supervisorship, and thence to Regional Office and Washington Office positions. In addition to the Forest Service, other government agencies are employing men trained in forestry work. They include the Division of Grazing of the Department of the Interior, the Tennessee Valley Authority, Soil Conservation Service, National Park Service, and Indian Forest Service. Foresters who have specialized in such lines as entomology and pathology find employment in the federal bureaus concerned with forest insect pests and diseases, and also with state forestry organizations.

The oncoming crops of young foresters who desire government positions may expect competition from older men now employed in emergency jobs and who will desire to continue in government work when these jobs have been discontinued, and also from men trained in other lines such as social sciences, business administration, botany, chemistry, and physics, who are getting into the forestry field in increasing numbers, particularly in the research lines which are becoming more highly specialized all the time.

The big field ahead for foresters lies in the extensive private forest land holdings of the country, which total about four-fifths of our forest land. Of this, planning agencies have estimated that about 90 million acres should be acquired by state governments and handled as state-owned forest land, and about 134 million acquired by the Federal government to be added to the National Forest system. This plan, if carried out, however, would still leave an enormous amount of land in private ownership which should be handled by scientific forestry methods. It only remains for land owners to be convinced of the desirability from a national standpoint and the practicability from a business standpoint of such methods. This convincing is itself a job for foresters.

Now, a word or two as to the kind of work a forester should be prepared to do. It covers a surprisingly wide and diverse group of activities. The popular impression probably is that the chief job of a forester is to fight forest fires. It is true that forest protection is a basic activity, as without protection there would obviously be no forest to manage. This protection includes not only combatting forest fires and inaugurating and maintaining fire detection systems, but also protection against insect and fungus attacks. The forest product with which foresters are chiefly concerned is, of course, ordinarily the timber. The production of timber crops through management of stands of trees is called silviculture. This involves mapping, estimating quantities, studying and computing the rate of growth, and the preparation of management plans which will provide for the harvesting of the crop on a sustained yield basis. Another important resource found principally in the forests and wild lands of the west is the forage crop, harvested annually by domestic stock and big game animals. Range management, therefore, rates high in the interest

of the forest manager in that part of the country. The management of forest properties, whether public or private, also demands administrative ability and skill in personnel management. A knowledge of business law has value to the forester. He should have some knowledge of arboriculture. Knowledge of and experience with logging operations are valuable, and in some forestry jobs indispensable. Road, trail, bridge, fence, telephone line, and other construction often make demands upon the forester. And he should be something of a land surveyor. The forester should know about wood preservatives, marketing products, and if he is thoroughly grounded in wood technology and chemistry he will find many opportunities to use this knowledge in the field of wood utilization, which is an exceedingly important one and vital to the whole forest industry. Wood laboratories and industrial concerns are constantly searching out new uses for wood and its chief constituents, cellulose and lignin. The trained forester may find himself managing a country estate or perhaps in a position where he will need to do considerable "public relations" work in advancing the interests of his profession and selling the worthwhileness of forest management among trade associations. Reforestation work, including nursery practice and field planting, offers a big field for men interested in that sort of work, both in public and private employ. The forester must be interested in soil erosion control and the subject of forest influences generally. In some parts of the country, particularly in the National Forests of the west, water for irrigation is probably the most valuable product of the forest, and watershed cover conditions are a primary interest of the forest manager. The forester should have a clear conception of the principles of land classification and land use planning. It is essential that he have at least an interest in fish and game management and recreational use of forest lands. Both of these offer increasingly important fields for specialization to those who may find them interesting.

It may be said that one of the primary qualifications for a successful career as a forester is an instinct for public service. Much of the satisfaction to be secured by a forester will come from a sense of worthwhile accomplishment for the future welfare of the whole nation. This is true whether he may be employed by a private land owner or by a public agency. Another qualification is a deep social interest. The practice of forestry and the management of wild lands touch the social welfare at many points, so that it is more than merely an attempt to make a profit out of the growing and selling of forest products. The forester, to be successful, must be a man of superior intelligence, with a broad educational background in fundamentals. Particularly should he be well educated in the use of English, both in public speaking and in writing. A good physique is naturally desirable, since the field work which a forester must necessarily do, particularly during the early years of his working life, will be a tax on his physical capacity. Merely a love of the outdoors, which is common to the majority of young men, is not sufficient qualification to fit a man for a successful career in forest management. He should appraise himself carefully before

deciding to study for this profession. Mindful of the fact that selectivity in the future in forestry will be similar to that in engineering, medicine, or law, he must realize that only those with best, all-round training and ability will get and hold jobs. There is real need, and opportunity, for quality in forestry as well as in other professions, particularly for men of statesman calibre. An education in a good forest school is, of course, excellent basic training for many other activities and occupations, particularly those of an outdoor type; but the majority of men, after spending four to six years in securing a degree in forestry or any other professional branch, look forward to securing their livelihood from the practice of the profession in which they have invested so much time, energy, and money. Therefore, it is the part of wisdom to consider carefully and weigh the demands and possibilities of each profession or vocation before entering upon a course of preparation. If inclined toward forestry, look at it realistically rather than romantically and try to get some practical first-hand experience before deciding. If the decision is in favor of forestry, the next step is to select the best possible forest school. Facilities and quality of instruction naturally vary among the schools. Information as to which schools are considered by professional foresters to have a satisfactory rating may be secured from the Society of American Foresters.

