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FOREST RANGER EDUCATION

BY DORR SKEELS

Delivered, before the Society February 11, 1915

What a ranger school should be must be determined first by what a forest ranger should be.

The ranger school in an eastern forest region which is training men for useful work in eastern forests, whether as ranger, guard, fire patrolman, woods foreman, or the superintendent of an estate, is filling an entirely different need than the western school which is training men for the public-service work of the forest ranger of National Forests.

My conception of a forest ranger in the National Forest Service is a man whose training should be so thorough and broad as to equip him for any of the work for which the eastern school trains rangers, as well as to equip him for work of a more difficult and responsible nature, which lies entirely without the province of the eastern school, because the work of a Government forest ranger is a public service of national scope.

In the old days of the Forest Service four grades of rangers were recognized, ranging in authority and rank from the temporary position of forest guard up through the positions of assistant forest ranger and deputy forest ranger to the higher position of a forest ranger.

The official description given in the early days by the Forest Service of rangers of various grades and the qualifications which the Forest Service sought to discover in these men conflicted curiously, with the requirements which were made for their entrance into civil-service employment.

It was said that a ranger of any grade must be thoroughly sound and able-bodied, capable of enduring hardships and of performing severe labor under trying conditions.¹ He must be able to take care of himself and his horses in regions remote from settlements and supplies. He must be able to build trails and cabins, ride, pack, and deal tactfully with all classes of people. He must know something of land surveying, estimating and scaling timber, logging, land laws, mining, and the livestock business. On some Forests he needed also to be a specialist in one or more of these lines of work. Thorough familiarity with the region in which he sought employment, including its geography and its forest and

¹ The Use Book.

industrial conditions, was usually required, although lack of this might be supplied by experience in similar regions.

Experience, *not book education*,² was sought, although ability to make simple maps and write intelligent reports upon ordinary Forest business was essential.

Rangers were expected to execute the work of the National Forests under the direction of the supervisor. Their duties included patrol to prevent fire and trespass, estimating, surveying, marking timber, the supervision of cuttings, and similar work. They issued minor permits, looked after grazing business, investigated claims, reported on applications, and arrested for violations of Forest laws and regulations.

Forest rangers might act as assistants to the supervisor. They might be given charge of the field-work of any portion of a Forest to which the supervisor was unable to give adequate personal supervision or of the whole Forest during periods when press of office work prevented the supervisor from taking the field. No ranger was authorized to hire assistants himself except in case of fire.

Deputy rangers and assistant rangers had charge of definite districts, to which they were assigned by the supervisor. They had supervision of forest guards stationed within their districts and might be promoted to rangers.

Surely these were duties and responsibilities enough to load upon a man about to be intrusted with the administration of an important public service and to be held for promotion to higher positions, and whose examination for fitness required for civil-service entrance was so simple that a lumberjack or cow puncher could be taken from a near-by camp and coached in six evenings after office hours by a clever supervisor or forest assistant to almost perfect points of entrance.

When the ranks were thus recruited, can we wonder that criticism was made of the Forest Service that its overhead organization for administration and supervision was top-heavy; that to get a dollar's worth of work done in the field required also the expenditure of an additional dollar in the office; that of the few cents per acre spent for fire protection in a district only about one-half was for actual field-work?

The old official description of the forest ranger's necessary abilities we know now was redundant and overdrawn. That formidable array of accomplishments was required, but never secured, at a time when the Forest Service was undecided as to what it was about to do and without certain knowledge as to the way in which it was to be of great public service.

² The emphasis is mine.

Now, when it may be said that the Forest Service has found itself and has entered into real, well-planned, well-directed service to the nation, it is handicapped by a rank and file of men measured and selected to a considerable extent by early standards, which did not even then properly gauge them for the work which it was wrongfully assumed they would have to do.

The forest ranger is now an important official of the Service. He has charge of a district, the extent and importance of which would be a responsibility and source of pride to the Ober Forester of a German State.

He is not a drawer of water and hewer of wood, but rather an important official, intrusted with the business of organizing and operating a Forest district. He is intrusted with the care and protection of valuable resources. He directs the work of subordinates and employs and pays wages to labor. The welfare and content of individuals and families, and even of entire communities or villages or towns, depend upon his judgment, ability, and integrity. He must transact business and meet on a level with men of ability and education and culture. He has to do with the management of land and must be able to make surveys and construct maps and to read them and use them. He has to do particularly with timber and must understand wood and its uses and values. He must know how to determine the methods and costs of production. While attending to the harvest of the present crop, he must look to the continuity of a future supply. His work is by no means merely that of administration, and is, in no little part, silvicultural.

Unless for every dollar paid to the ranger and his subordinates there be paid to overheads a nearly equal amount for supervision and direction, he must understand the basic principles of tree culture and the care and protection of woodlands and the guidance of their growth to maturity.

It would be a mistake to assume that we are just now concerned in western forestry with only the removal of our present crop. Progress today is so rapid that changes follow each other in almost bewildering succession. Where the tree stands today, it is gone tomorrow, and we must concern ourselves with producing another.

True though it is that a great important problem is the proper utilization of our present stands, we practice silviculture even with the removal of our mature timber, and when it is gone, whether by fire, clean cutting, or such silvicultural method as reserves a part of the old stand, we are immediately concerned with the problem of a future growth, and this perhaps in the same ranger district and probably in the same gulch where we are yet concerned as to how we shall remove remaining portions of the old crop.

Unless we are to put upon the ranger responsibilities for which he has no training and under which he will fail, or else make of every ranger station a boarding-house for supervisory and administrative overheads, the ranger must be trained in the work which is required of him.

We are by the point when we may complacently dally with the idea that the ranger need be only superficially trained in the practical phases of his work or that a technical training in the sciences of forestry will leave him unfit to practice the arts of forestry.

If the Forest Service is to practice forestry, as well as to merely administer the uses of a public domain, its workmen must understand the theory and practice of forestry; and now, when our problems are only becoming apparent and methods are yet to be worked out, our men on the ground must be of large, broad training and capable of original and constructive work. As much today as when the forest ranger was so fully described in *The Use Book* is the ranger still "given charge of the field-work of any portion of the Forest to which the supervisor is unable to give adequate supervision, or of the whole Forest during periods when press of office work prevents the supervisor from taking the field."

In my opinion, hardly less important to the Forest Service than the quality of work secured is the proper training of subordinates to assure a sufficient supply of satisfactory men as material for promotion. The fact need not be disguised, and it is but natural and to be expected, that many men yet hold important administrative or supervisory positions who are either not properly trained for their work or are otherwise unfit for the position. They cannot well be supplanted until better material is available for their replacement. For many of these positions the highly technical training of the professional forester is as unfit as the qualifications of rough and ready experience of the early type of forest ranger. Professional training does not fit a man for an administrative office, although it no more unfits him for that work than would technical training unfit the ranger to practice the works of his district. If the technically trained, professional forester practices his profession, however, he has little time for executive work and secures little experience in administrative affairs.

The work of the forest ranger is necessarily largely of an executive nature, and, if his training has been sufficient, the very nature of his work is to prepare him for administrative positions of more importance.

When overhead expenses of administration and supervision may be reduced by delegating to better-trained men on the ground larger duties and greater responsibilities, there will be no less the need for professional foresters of high technical training. Rather will a greater opportunity

be given for the thorough, efficient work of such men when the district offices, and to a considerable extent the supervisor's offices, may be relieved of present exacting need for attention to innumerable small details and the inspection and supervision of work which the man on the ground is not yet properly trained to perform.

The training of the forest ranger in the theory and principle as well as the art and method of all the primary branches of forestry will not decrease the value of the graduate school for higher training in professional forestry or limit the opportunities for usefulness of the highly trained professional forester. Instead, our large universities, with their graduate courses in technical forestry, will have a greater field of work. Technically trained graduates will find larger opportunities when the workmen who carry out their plans have a proper skill and training in their vocation. Greater results and larger accomplishments may be achieved by the professional forester when his subordinates have in themselves such skill and proficiency in their work that a larger number may work under the direction of one man without constant supervision and inspection and the retrieving of mistakes and blunders.

I believe, however, that the point may yet be fairly made that some of our great universities which attempt to give graduate courses of technical training for professional forestry do not, as a matter of fact, produce real professional foresters or men of really high technical training. This, it seems, is due principally to the lax requirements for undergraduate work as preparation or qualification for entrance. When men may enter a graduate course of professional training impartially from undergraduate courses in arts, sciences, agriculture, various branches of engineering, or even such irrelevant lines of work as literature or law, or when the only requirement for graduate entrance is a collegiate degree, it may be expected that many poorly trained and well-nigh useless men will be the result. If great eastern schools of forestry are to retain their prestige and command the business of technical training of professional foresters, they must be sincere and thorough in their methods and efforts.

As a further explanation of such laxness in professional training as may exist in the greater eastern schools may be cited the tendency in western forest regions to slight or discredit the man trained merely in technical forestry. Limited opportunity is given him to practice his profession. Real practice of forestry is left largely in the hands of men of indifferent training, who hold the more responsible positions largely because they were early in their places. Usually the man of professional training in forestry from the eastern school, when he comes into the western forest region, is put at work which requires little technical

knowledge of forestry and is really the common work of the forest ranger or more often of his subordinates, and a great proportion of the professional foresters who become thus engaged never emerge from such common work to really practice their profession.

The only plausible excuse which may be offered for a long continuance of this condition will be the plea that the man from the older eastern forest schools is not actually better trained in forestry than the man who early entered the Service with indifferent training and is now doing the responsible work or the men who are now entering the Service from the newer undergraduate schools of the West. Whenever this plea is a true one, the eastern forest school of graduate professional training is at fault.

I do not believe that great schools for the higher technical training of professional foresters could be much more advantageously located in the West than in the East. In the curricula of such schools a thorough understanding of principles is of far more importance than to merely learn methods of practice. To acquire high, specialized professional training requires first a complete education in auxiliary sciences and arts and then intense specialization, and this may be best had in great universities, with their numerous specialists, exceptional advantages of libraries, laboratories, and museums—fine atmosphere of learning and unlimited incentive to investigative work.

By this is in no way meant that professional foresters need not have woods experience. Forest schools need not send out men who, to all practical purposes, have never had experience in the woods, and even universities located in great eastern cities may find opportunity for practice work in the forests of many various regions in the vacation months.

In the West, however, is the place for great undergraduate forest schools, which shall bear the same relation to forests and forestry and lumbering and wood-using industries that a school of mines bears to mines and metallurgy and mine industries, or a school of agriculture bears to farms and the agricultural sciences and the cultivation, harvesting, and marketing of food-stuffs. Such schools will be in part industrial and give vocational training rather than high professional training.

The interest of the great eastern graduate schools of forestry should be secured by the western undergraduate schools, for from them and from the ranks of their graduates in the practice of western forestry may be recruited splendid students, who have had a proper undergraduate training, have completed the apprentice period, and are prepared to receive a real professional training.

To be completely useful, a western school which bears such relations must have two broad departments of training, one of which is a department in which a training is given in the arts, sciences, and principles of fundamental branches of forestry practice; in other words, a ranger school. Its other department would concern itself chiefly with lumbering, involving many of the principles of forestry, but treating more extensively of the technics of wood, wood uses, and all the other branches of forest utilization, including logging and the manufacture and marketing of lumber and other wood products, and training to a much higher degree than the ranger school in various branches of engineering.

If the ranger school is to take inexperienced men and make of them what we need and would have in our forest ranger, four years of training are necessary, and with that the student must come to the school with a high-school training or its equivalent. Four years of time prove short enough to train a man in the principles of forestry and give him ability for practical work.

No more perplexing problem can be offered the teacher than to arrange thorough training in basic theories and principles with field study and practice work, and I believe no greater error can be made in training the ranger than to try to make of him a mere craftsman. Practice in the actual work is not nearly so important as solid training in the principles of forestry. It would be a mistake to have students spend hours of their class time in building a trail which they may learn later to build as well in no greater time when they are actually in the work. Education time should rather be devoted to training the student in principles which he could not otherwise acquire or which would be had only imperfectly and very slowly from mere practice in the work itself. Filibert Roth once expressed this clearly when he said we "must choose between mere learning of methods or a thorough understanding of principles," and that it is better to "train to think and work out problems rather than to have pupils memorize facts and fixed methods."

Early forest schools were unfortunate because their trail had not been blazed. It was uncertain then what forestry would be in America or what American foresters were doing or what they would have to do. Today past performances in American forestry may be reviewed, and thus may be foreseen quite clearly what foresters will be called upon to do at least in the near future. We may now at least always keep our ideas far enough advanced to make the necessary changes before the altered conditions are reached. More than any other school of forestry, the success of the ranger school will depend upon the close knowledge of those in charge of the school of the conditions in the regions which the school

is to serve and of the services which its rangers will be called upon to give.

In arranging the curriculum of a ranger school it must be borne in mind that general education must be given as well as vocational training. Men of advanced years or who have passed the age for education cannot be persuaded to attend a school of thorough training. The students who will come have their education not entirely completed. In order that so much as possible of the courses of instruction may be devoted to the science and art of forestry and to training for the work of the ranger, it is important that they come to the school with preparatory education such as is afforded by a good high school.

In the first years of the curriculum must be given much of the training ordinarily classified as cultural, such as English, composition, mathematics, economics, history, and perhaps a language. The auxiliary sciences must, of course, be taught, including such as biology, zoology and entomology, geology, physics, and chemistry. Botany must be set apart for a more thorough teaching as a part of silviculture, and I would carry as one line of study through the entire four years the various branches of botany and silviculture.

Fire protection should be treated as a part of forest administration, as may also be grazing. I would have forest administration run as a course of study through all four years, beginning with its economics, giving the prospective ranger a fine conception of his duties as the administrator of a public service, training him well in the administration of all Forest uses, the various duties of the ranger and their methods, the business of organization and operation, and the principles of management. Parallel with these lines of study, I would give through four years a series of studies in utilization, relating solely to wood, from the properties of wood through all forms of logging, manufacture, and the like, to the marketing of wood products. Again, parallel to these should run four years of the works of surveying and civil, mechanical, and structural engineering, drawing, map-making, considerable mathematics, shop practice, and the like. Forest mensuration in all its details, considerable work in lumber grading and mill studies, and particularly thorough work in scaling and cruising and forest appraisals require four years for proper completion. When a little applied mechanics and some study of motive powers is added to this list, little room is left where we would like to give a little more training in English literature and composition, a little live-stock husbandry and agriculture, more soils, a little more physics and chemistry, and engineering, but cannot for lack of more time than four years.

The student in the ranger school is carrying eighteen to twenty credit hours of work when other schools and departments of the university require but fifteen and sixteen hours. Much of his time, too, is in field, laboratory, and mill and shop work, where three hours of actual time count only one credit hour. Yet our ranger is by no means overtrained. He is far from being a technical forester, but has a good, thorough working knowledge of the fundamental principles of forestry. Rather better than that, he is trained to work intelligently and with understanding and to satisfactorily perform the business of a ranger. He is material for advancement and promotion. His very education and training give him an interest in his work, steadfastness of purpose, and loyalty to the profession of forestry and to the Service in which he is enrolled.

It was questioned for some time if suitable material would come into a forest school for four years of education and training in the work of a forest ranger. We know now certainly that it will. In order to secure men in the Service who have only ordinary ability to transact the responsible work of the forest ranger, even with no requirements as to education and training, it has been necessary to pay practically the same salary as for professional foresters in the Service of the rank of forest examiners, and involves as many responsibilities. With the improvement of ranger stations and of means of transportation and communication, the ranger is able to spend as much or more time with his family than the forest assistant, and in many cases more than the forest supervisor or even members of the district office or of the Forester's office.

If properly trained in the ranger school, his opportunities for advancement depend only upon his native ability, personality, initiative, and force of character.

An entirely different thing is the short course in forestry or winter school for forest rangers offered in several of our western forest schools. It is unfortunate that we gave to this special course of training the name of ranger school at a time when our western colleges did not offer regular courses in forestry and the real ranger schools which offered four years of undergraduate training had not yet been developed.

These short courses fill a real need in the Forest Service. In the ranks of forest officers are many men of splendid natural ability and of considerable elementary education, much experience in their work, and an intense loyalty to the Service. Many of these men have been able through carefully arranged courses of reading and through their contact with the professional foresters of the Service to gain a considerable knowledge of the principles of forestry. The experience and knowledge gained by such men in the practice of their work cannot be easily replaced, and

the natural alternative is to endeavor to complete their training at least to such an extent as will give them a fair efficiency in the ordinary routine of their work.

Such short courses were at first usually limited to six or eight weeks. In some of the schools their length has been extended from year to year, and in the school of which I am director we offer this year fourteen weeks of training for forest rangers. The ranger comes to such a short course with considerable difficulty. It costs him not only the expenses of college work for fourteen weeks, but also his loss of salary for that time. In this case it is especially necessary that his teachers should know exactly what he needs and just how to teach it to him. The teaching force should be composed almost entirely of men of long experience in National Forest work and of certain ability themselves in such work. The training must be principally in methods and in the application of principles to practice. The ranger must be directed to much reference work and every effort made to have him establish for himself the fundamental principles by further reading and studying when he returns to his ranger district.

Some of our rangers have returned to these special courses to take a second and more advanced course, and this winter some men will return for second and third courses of study.

In this paper I have frankly stated my own opinions. Although I have had some experience in National Forest work and in developing and training forest rangers, I have to admit almost entire lack of experience in regular teaching work. It may be that as I shall develop my own ideas of what a ranger school should be, I shall discover many mistakes, and I shall not be dismayed when this occurs.

The success of a four-year course of training for forest rangers seems already assured. We shall endeavor to give the training which is really needed at this time, changing our curriculum as conditions alter, and we shall only train as many men as there is need for in rangers' work.

Above all, we shall not attempt to fit unpracticed material for the work of forest rangers in less than four years of training, nor to encourage any student to secure less than four years of training, unless he already has considerable training in the way of practical experience and a record of fairly satisfactory service in the unskilled lines of forest work.

DISCUSSION

By PHILIP T. COOLIDGE

The problem of improvement of the ranger force raises the question whether it is intended to (1) replace present rangers by men with technical (ranger) training or (2) to improve the present force.

Replacement of the present force by men with more technical training would be accomplished by such a course as outlined by Skeels. Instruction of this character might well receive the attention of schools of forestry which are now giving inferior instruction in technical forestry. My feeling is, however, that the immediate needs pertaining to the personnel doing work of ranger grade, whether on public or private forests, would be met more effectively by short courses for men of proven ability in woods work than by long courses training new men.

In connection with ranger instruction generally I should like to emphasize four points:

1. In soliciting students great care should be exercised in stating the field of employment. The National Forests are such a field, but in many regions, even where lumbering is important, the prospective student cannot fairly be led to believe that there are positions in the ordinary sense.

From another point of view, the best results for all concerned are reached by definite arrangement to meet the needs of the employer. The ranger school should not be perverted into an attempt to force men with a knowledge of forestry upon employers. The arrangement between the Pennsylvania Forest Academy and the State forest administration is a striking example of instruction intended to serve as preparation for particular employment.

2. I should prefer that the candidates for ranger instruction should have had some woods experience, or that students should be required, as part of the course, to secure some woods experience away from, the school. This seems to be the best method of weeding out unsuitable men, and it is undoubtedly the duty of ranger schools which train green men to do a certain amount of weeding. The demands of the public may hamper such requirements in State institutions.

3. There should be a minimum of work of an apprenticeship character, and, if any, it should be paid for. In general, training in ordinary woods labor can be secured much more easily under employment outside of a school, and employment of this kind is apt to interfere greatly with classroom work. The conditions under which ordinary woods work can be carried on at a school are not typical of conditions outside, and are therefore

without educational value. The ranger school should be a school, not a shop. An abundance of laboratory work, in the field as well as in the classroom, rather than apprenticeship, best meets the needs of the course.

4. The length of course depends upon the class of students to be taught and upon the field of employment. As the men suitable for ranger work are usually poor, courses, in general, should be short; but it is inadvisable to attempt to formulate much more definitely what the length of course should be.

For men under employment three or four months is the maximum that they should be expected to afford and is generally more than they can afford. The Pennsylvania course of three years is, on the other hand, satisfactory, I believe, probably because students are assured of employment. The four-year course which Mr. Skeels outlines, however, is only one year shorter than courses in many schools of technical forestry, completion of which gives graduates full standing in a profession recognized as scientific. Men who can afford to take long courses are apt to have tastes which do not fit them for continued ranger work. The real need of ranger instruction is to teach everyday forestry to men who will stay in the woods.

As to instruction, the average technically trained forester is apt to spend too much time upon botany and similar purely, scientific subjects. It is surprising to find how little instruction of this kind is really necessary and how quickly the interest of students in it flags.

The ideal instructor in a ranger school should have had, in addition to technical training in forestry, considerable practical experience in forest administration or lumbering, depending upon the field of employment to be supplied.

By W. D. STERRETT

As a result of Mr. Skeels' paper and the discussion which followed, the following summary of suggestions is offered for a possible Federal Forest Service attitude on the subject of ranger education:

1. The Forest Service desires to obtain the best equipped men in ranger positions.

2. Rangers can only be considered *completely* equipped who have gone through some such school (or its equivalent) as outlined by Skeels, which, of course, prepares the man also for other jobs. Name for such a school not important. It is, however, important to get men whose knowledge and training is of the broadest kind, as such men will be able to grow as fast as the Forest Service grows in adopting intensive methods.

3. At present it is probable that only a small per cent of such graduates would become rangers.

4. The proposition is, then, for the Forest Service to encourage an increase in the number and capacity of such schools, so as to have a larger number of possibilities to draw on.

5. It is out of the question that such schools could be run as administrative work of the Federal Government, as the State of Pennsylvania does at Mont Alto.

6. Education of rangers from a Forest Service administrative standpoint will have to be confined to: (1) correspondence courses and personal instruction in the field by forest experts; (2) encouragement to them to go to regular schools for short intervals (by holding their jobs open), with the idea of their finally fully qualifying (technically) by graduation. Proper credit, of course, should be given them in the schools for their training and experience and private studies in forestry, which would greatly cut down the time they would need to spend in schools.

7. As the number of such schools and its graduates increase, ranger education, as administrative work, would diminish, although it should, of course, never entirely disappear, as it is full of good possibilities, even for a well-educated body of rangers.

8. As Coolidge says, a one-year ranger's course, such as given in New York, is a waste of time and money for the man taking it. If it were a purely administrative proposition of increasing the knowledge of men already selected by the State for rangers, it would be a different matter; but as it is, it is impossible to properly equip a young man in one year in the vocation (if there is such a thing) of ranger so as to make him eligible to any ranger job which may come along. Three or four years is absolutely necessary for training the young man for the general vocation of ranger, and it is not fair to him to advertise short cuts to this end in the guise of one-month or one-year courses in forestry. On these grounds it might be proper for the Forest Service to discourage entirely one-year ranger schools.