THE DEVELOPMENT AND FUNCTION OF PUBLIC FORESTRY
IN SWITZERLAND
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PREFACE

Inasmuch as the author lived for five months in Bern, Switzerland, within the high-lead distance of both the Federal Inspectorate of Forestry, Hunting, and Fishing and the National Land Library, he decided that the logical subject on which to write a paper was the public forestry of that country. During the course of the writing the basic aim of the paper was changed somewhat, as explained in the introduction, but its superficial structure was not since that structure best showed the resulting aim.

No doubt there will be some question as to the advisability of treating such a broad subject in the limited scope of a paper of this caliber. However, upon considering the unfamiliarity of both himself and his readers with the entire subject, the author decided that he was justified in attempting to provide an introduction to the whole subject rather than in making an exhaustive study of some small phase of the larger field, leaving himself and all concerned with no true picture of the importance or relationship of that small phase in the vague fog of an unknown whole.

Due to the difficulties encountered in the translation of the involved German and French in which technical and official publications are couched, it was not possible to cover all of the available works relating to the subject. However, the author believes that most of the important ones were covered and that an accurate and reliable account of the subject is presented.
The social significance of the subject is his own derivation, arrived at through eight months of observation of the basic resource of any country, its people.
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INTRODUCTION

The following paper is a short dissertation on the development and duties of the office known as "Der Eidgenossischen Inspektorat fur Forstwesen, Jagd, and Fischerei" (The Federal Inspectorate of Forestry, Hunting, and Fishing) and the Cantonal Forestry Departments in Switzerland. The paper is not an attempt to list the specific duties of these offices, but rather to use them as the medium through which to transmit a concept of the character of Swiss thought in the field of forestry.

Switzerland is looked upon as the most democratic country in the world today. Yet the reader will be surprised to find to what extent the central government exercises autocratic controls on the technical level. This will seem to be a paradox — a paradox of democracy versus almost dictatorial regimentation of the individual in his relationship to the natural resources and their productive use. But reflection will show that, human nature and the human mind being what they are, this is the probable ultimate end product of any organized social system which truly attempts to treat the natural resources of its land as the national heritage of all its people.

We see more and more of this regimentation in the United States, not only in the technical field of forestry, but in the entire narrowing and standardization of the individual. It is the result of the giving up of personal exaggeration for the simple, solid lines of national exaggeration. In forestry, it is the cost of the benevolent leadership established by popular demand on which the laissez-faire
producer makes a down-payment every time he fails to assume that leadership himself.

And so today one finds in Switzerland a small, highly organized country. Its democracy is the democracy of choice of major policies and patterns of action. Its regimentation is the strict adherence to the rules and regulations set up by technical men appointed to carry through those policies. It is a country in which the people have been educated to really believe in the rights of man above the rights of men, with the results that the rights of men have often suffered. In their fight for social order and right, the people have lost their freedom of interpretation and the reliance on their own judgment and training. They have reduced themselves to cogs in a well-ordered and smooth-running machine.

The average American's concept of Swiss history is limited pretty much to the story of William Tell. This, though the symbol of an important phase in Swiss history, by no means gives a complete picture of the complex development of the present Swiss nation.

Returning to pre-Roman times, one finds a Switzerland that existed only as a gateway through which passed the hordes of humanity in their immigration from one climate to another, for it is the division between the Nordic lands of the North and the Latin lands to the South. In this capacity it was an important part of the Roman Empire, whose highways wound towards the North through its narrow passes.

While the Roman Empire gave a momentary stability, its passing
renewed the nomadic wanderings of entire populations through and over this land. All of this movement and instability developed in the native inhabitants a certain philosophy of patience, of live and let live, which was reflected in a character of independence among the small community governments. The abrupt changes in climate, terrain, and speech within such very short distances also helped develop this character of personal and community independence. In fact, while from time to time alliances were formed for various purposes, the Swiss Cantons did not actually form a compact and single nation until just over a hundred years ago.

It was this philosophy of complete laissez-faire that brought about the near destruction of the land which resulted in the present character of Swiss thought. For with the ever increasing needs of the growing population for lumber and agricultural land, the forests were cut more and more heavily. In other lands this has resulted in increased erosion and flooding. Switzerland was no exception. But what in most lands was destructive, in Switzerland was devastation. Wherever the mountainsides were laid open to the whiplash of the rain the results were floods and avalanches that spread ruin in the valleys below.

One immediately wonders why action was not taken at an early stage to stop this destruction. The answer lies in the basic attitude of laissez-faire that then existed. The disunity between mountain and valley communities did not further the cause of conservation, while the freedom of the individual within his own
community disrupted any attempts to put a stop to the destruction.

However, as time went on the communities began to group together into Cantons, to form small state governments given authority to regulate certain matters of public welfare. Among these matters one of the most pressing problems was that of floods. Rules and regulations were drawn up and approved. But at first they were usually limited to a reading in the churches and posting in public places, and had a very limited and local effect. Often they were forgotten soon after passage. Enforcing officials, where such existed, were local politicians, usually devoid of forest and often even agricultural understanding.

As the Cantons became more advanced in the principles of government, some of them developed rudimentary forestry departments and came to regard the forests of the Canton as integral parts of the state resources. The early departments were limited in scope to the bringing about of a rational and profitable management of the state forests. Their development into full-fledged forestry departments, regulating the management of all forest areas within the boundaries of the Canton, was very gradual. They of course varied radically in their organizations, duties, and powers from one Canton to another. In fact, some Cantons were completely devoid of anything resembling a forestry department or forest law until the Federal Forest Law of 1902, requiring them to have both, was passed by the national congress.

Hand in hand with this development of governmental powers of regulation there was developed in the people a new religion of thrift
which soon became more powerful than any statutory attempts to bring about conservation. Men gradually came to see that they could not go on in their old ways. They began to accept a new doctrine which said that you must not plan for just next year, but forever. Gradually they applied this new idea to all activities until it comes to the point, today, where everything and anything is saved, just for the saving. The scales have become so tipped that often ridiculous pains are taken to make relatively unimportant savings of materials and resources. To one educated in the American way of plenty this thrift often takes on the appearance of miserliness.

This extreme thriftiness quickly usurped the right of laissez-faire. Not only did public opinion demand conservation but the producer himself soon became a slave to the doctrine. It was not just a matter of conscience; it was a matter of imagined self-preservation. He would no sooner knowingly mismanage his lands than his horse or his wife. Thus, he quickly accepted the rules and regulations given him by his cantonal foresters and regarded them not as mere rules forced upon him by intruders, but as his own way of thinking.

This is a concept that is a little hard for Americans to grasp. We are brought up in a society which generally regards the law as an unnecessary restriction on our personal liberty, imposed on us by some deaf, blind mute, to be disregarded whenever we believe that we have a better or more plausible solution. This is not the way in Switzerland. In Switzerland it would be sacrilege to even think
contrary to the orders of the government on technical lines. No matter how much argument there is over a policy or an objective, once that policy is decided by the majority, the technical means used to carry it out are unquestioned. In other words, man is not a law unto himself, but rather, the law of man is (becomes) the law of himself.

Thus we see how the political democracy of choice of policy lives side by side with dictatorial regimentation on the technical level. Since men would not think for themselves, man has thought for them. And man has subjugated them to his will. Man is the political and social body which decides, en masse, the policy. Men are the moral individuals who act under the guidance of other, technically trained men, officially appointed, to carry out those policies.

Men have lost the right of personal exaggeration in return for the comfort and security of man's exaggeration. Men have paid the full cost of the benevolent leadership of man by refusing to be themselves the individual leaders of the men, themselves.
THE DEVELOPMENT AND FUNCTION OF PUBLIC FORESTRY
IN SWITZERLAND

Switzerland was still but a loose federation of states in 1843 when the awakening of some of the people of the Cantons to the needs for conservation brought about the formation of the Schweizerischen Forstverein (Swiss Forest Society). This society was the first national organization of its sort in the country and quickly grew in strength and size to become a powerful instrument working for the cause of conservation. It constantly pressed the cantonal governments for better forest regulations and carried on a large program of public education in the elements of conservation.

By 1874 the society was so strong that it was able to get an article placed in the new constitution of that year giving the "right of supervision of the forest police in the high mountains --" to the federal government. Armed with this constitutional federal right, it immediately drew up and submitted to the National Congress a complete forest law bill and requested the establishment of a federal forestry department. These requests resulted in the formation of The Federal Inspectorate of Forestry in 1875 and in the passage of the Federal Forest Law of 1876, based largely on the bill submitted by the society.

This law was decidedly a "forest protection" law. It applied to those forests in the mountains only, giving the government the power to regulate cutting practices and to promote reforestation, dam building, and terracing in those flood-source areas.
As time went on, the government paid more and more attention to this task, and increasingly larger federal appropriations were granted to finance it. Simultaneously, the people came to realize that simply eliminating the source-point of the floods would not eliminate the floods. Gradually they realized that the forests of the valleys and lowlands were as important as those in the mountains for their prevention. And so, in 1897, twenty-one years after the passage of the first forest law, it was revised and the restrictive words "high mountains" stricken from it. This extended the federal government's power of supervision and regulation to all the forests of Switzerland.

This does not mean that the federal government set up a department of forestry, with federal foresters actively directing the management of forest areas. All it means is that the already-formed cantonal forest departments fell under the supervision and regulation of the federal government; that they were held responsible not only to the cantonal governments, but also to the federal government.

To handle the administrative work of this supervision, the already established "Federal Inspectorate of Forestry" was enlarged and revised. When first founded, the office was composed of only the chief inspector and his adjutant, but periodic revisions and additions have enlarged it, both in size and in the scope of its duties, until today it has 25 men of professional rank and includes the staves of the School of Forestry at the Federal Polytechnical Institute and the Research Institute, both in Zurich. The office itself has headquarters at Bern, the national capital, though few of the staff spend much time there.
Structurally, the department is composed of the Inspector-in-Chief and his two adjutants, two inspectors-at-large, an inspector of fisheries, and seven inspector-forest-engineers, each assigned to one of the five federal forest districts of the country. The Forest School has three professors and two assistant professors, and the Research Institute a director and four research men equal in rank to the inspector-forest-engineers. There are two miscellaneous foresters: one who acts as liaison with the military department and one who handles the forests of the federal railway right-of-ways.

The duties of the office will become more clear in the later treatment of the present Federal Forest Law, but, briefly, they are the inspection and judgment of all matters pertaining in any way to the Federal Forest Law. As stated before, it does not work directly on the individual forest holder, but rather on the Cantons. In other words, it acts as a central clearing board for inspecting and approving all cantonal actions which come under the Federal Forest Law. This includes the enforcement by the Cantons of federal laws and regulations, the approval of all cantonal projects such as afforestation, flood control, etc., for which federal financial help is requested; as well as the approval of the Cantonal Forest Laws and forest department organizations themselves. It has no direct power to enforce its decisions, but inasmuch as its approval is necessary before any federal funds will be granted for subsidization of cantonal projects, its control is rather effective. Another strengthening factor is
that it pays 25 to 35 per cent of the salaries of all cantonal foresters.

The office was completely reorganized twice: once in 1908 and again in 1919. Except for a brief period in the Department of Commerce and Agriculture (1879-1896), it has been in the Department of the Interior since its founding. The offices of Inspector of Hunting and Inspector of Fishing were added to it in 1880.

Before leaving this introductory treatment of the office, brief mention should be made of Dr. Johann Coaz. Dr. Coaz was the first Inspector-in-Chief and held that office for almost 40 years (1875-1914). He was a man of unusual vitality and energy, and the present state of the country owes much to his foresight and intelligence. It was largely his personal diplomacy which brought about the cooperation of the Cantons and gained for the country a unity seldom seen in the world today. Under his guidance, the office grew and flourished, gaining the respect of the federal officials, the Cantons, and the general public, a job that required much tact indeed. He truly belongs to the long line of great men which forestry has produced.

Before proceeding to a discussion of the present federal forest law, the reader must be made better acquainted with the modern cantonal forestry departments. Their early development, as previously indicated, was a matter of independent action by the individual Cantons. But with the passage of the Federal Forest Law of 1902 they were all required by Article VII of the law to form a cantonal forest department acceptable to the federal government and to draw up a cantonal forest law for which the Federal Forest Law was a minimum base. While some
of them simply adopted the federal law intact, most have developed very complete laws and administrations, especially the larger Cantons. Structurally, the various cantonal departments are fairly similar. At the head of the department stands the State, or Chief Forester. He is the single and direct administrator of the department. Under him come the cantonal foresters, under-foresters, engineers, etc. Their number and field specializations of course vary widely with the needs and development of the individual canton. (Together, the 22 Cantons have 238 foresters of professional rank.) Acting through them, the State Forester enforces the cantonal laws (and hence the federal laws, also), directs the general technical management of all forest areas in the Canton, combats erosion and flood control problems, and generally preserves the forest and political interests. He is also usually charged with the preparation of all cantonal forest legislation.

Many of the larger communities and cities employ foresters to manage their forests. Though employed by the community or city, they are responsible to the cantonal forester (or directly to the Federal District Inspector in some Cantons) for the proper management of their forests. Their duties are similar to the cantonal forester's, except that they have fewer administrative duties, being mostly concerned with the direct management of their forests.

There are no private forests large enough to maintain separate foresters. Technical management is provided for them by the cantonal foresters.

We now have a picture of the structure and general duties of
the Federal Inspectorate of Forestry and of the average cantonal forest department and will proceed to the Federal Forest Law which binds the two together and clarifies their duties. In all cases the federal agency is responsible for carrying out the various duties or responsibilities assigned by the law to the federal government or the cantonal governments.

The present Federal Forest Law of Switzerland was passed by the National Congress in 1902. It stands intact today with but minor changes and additions. It is, as were its predecessors, mainly concerned with forest-protection. Under it all forests are treated the same regardless of ownership. It prohibits the decreasing of the forest area of Switzerland. It prohibits clear cutting in all "protection" forests. It prohibits the detrimental usage of any forest area. And it encourages the combination of private forests, either with each other or with the public forest, for purposes of mutual management. It also provides aid for the reforestation and building up of degenerated lands, for bringing stocking up to normal, and for the construction of physical aids such as dams and terraces, against erosion in general.

The power of supervision of the forest police in all of Switzerland is reserved to the Federal Government by Article I. "Forest Police" is merely the term applied to all cantonal foresters, under-foresters, forest guards, etc. There are no Federal Forest Police. Hence, this clause simply makes the cantonal forest depart-
ments subservient to the federal government. Articles V and VII say this more directly by subjugating both the cantonal laws and the activities of the cantonal forest departments to the approval of the federal government.

Article II extends the authority of the cantonal forest departments (the forest policy) to "all forest areas, and woodlands, including all forest pasture lands contained within the forest or woodland area, both public and private where included within public holdings." Later in the law, all private lands are subjected to control in certain matters. This will be clarified a little later.

Under the title "public forests" are included city, state, community, and corporation forests. The terms 'city' and 'state' are self-explanatory, being simply those forests owned by the cities, Cantons, or federal government. Actually there are practically no cantonal forests and only about five per cent of the total forest area is in federal ownership, that being comprised mostly of railroad right-of-ways. The community forests are, as the name implies, owned by the communities, which in Switzerland means literally the community of persons. Each landowner has a share in the community forest and is entitled to his percentage of its produce. It is, in effect, a private forest owned communally.

The corporation forests are a little more difficult to explain. True, they are really private forests owned by small groups of people who have incorporated themselves, but these corporations are very old -- 300 years and more -- and the ownership has stayed within the
same families for generations. This does still not explain why they should be treated as public forests, but they are, being subject to all the controls imposed on the true public forests and being open to the public for any non-commercial use. Sixty-five per cent of the forest area of Switzerland is in community and corporation ownership.

The classification of forests and woodlands into city, state, community, corporation, and private forests is carried out by the Cantons. City and state forests are self-classified, but it is sometimes difficult to classify a forest as community, corporation, or private because of the vague lines of demarcation between the groups. The Federal Inspectorate must approve of all classifications and thus acts as a higher board of decision in cases of dispute.

Article VI requires the Cantons to subdivide their forest areas into districts according to general topographic and silvicultural grouping for purposes of administration and management. Six Cantons are so small that they contain themselves within one district, while the rest have districts ranging in size from 7,500 to 47,000 acres. (District sizes within the individual Cantons are fairly regular).
The subdivision is, of course, subject to federal approval.

Protection Forests

It will be recalled that the Federal Constitution of 1874 was quoted as saying that "The federal government has the right of supervision of the forest police..." It goes on to state that it will also
"... supervise the correction and control of uncontrolled waters ...".
The granting of these two powers in practically the same breath is
concrete confirmation of the conditions and development leading to the
assumption of federal controls and makes a formal recognition of the
most important job of the Swiss Forests: protection.

Under the authority of these two clauses, Article III of the
Federal Forest Law directs that all forests in Switzerland be
classified as "protection" and "non-protection" forests, regardless of
ownership or political districtization.

The protection forests are those forests found in the mountainous
areas -- the areas of the uncontrolled waters. Their main function is
to control water and to protect against and prevent climatic changes,
avalanching, snow and stone slides, etc. Since 1883, when the principle
was first incorporated into federal law, 74.5 per cent of the total
forest area of Switzerland has been classified as protection forest.
This varies within the individual Cantons from 5.7 per cent to 98.6
per cent.

Private and public forests classified as protection forests
are completely subject to federal regulation in the eyes of the
present law. (Article XXVII). Not only is clear cutting strictly
forbidden (Article XXXI), but proper stocking must at all times be
maintained (Article XX) and management must be on a proper basis
(Article XXI and XXIV). If any private owner, corporation, or
community fails to comply with any federal regulation, their lands
may be taken from them and placed under proper management (Article
Either the Canton or the federal government can order the re-stocking of a protection forest which it deems to have fallen too low in stocking. Either can order the building of roads, dams, terraces, etc. Also, either can order the creation of new protection forest by reclassification of non-protection forest or by afforestation of non-forested areas (Article XXXVI).

When there is any major natural catastrophe, such as a fire, windstorm, etc., it automatically becomes the job of the Cantons (and under them, the forest owner) to reforest the area within three years of the occurrence of the damage (Articles XXXII and XXXVII). If a private owner fails to do this his lands are taken from him, (Article XXXIV). Of course, neither the Canton nor the private owner can be expected to stand the entire expense of this reconstruction. Federal help ranging from 40 to 50 per cent of the cost is provided (Article XLII), and private owners are usually provided with additional aid by the Cantons.

Since the end of the war, there has been considerable additional work in the restoration of lands degenerated by the heavy use and overcutting during the war. Steps have been taken to build back the reserves which it depleted. In many cases this has included complete withdrawal from use as well as simple reforestation and rebuilding of roads, dams, and terraces.

So far, we have been regarding the forests as a means of
protection, in the passive sense. One of the growing tasks of the Inspectorate has been the promotion of forest protection in the sense of the words as we know them in the United States. The Swiss are a little too prone to believe that forest protection is merely a matter of passing laws protecting the forests from destruction by man. Too often natural destruction is something merely observed and reported. This is, of course, resultant of the main source of direct destruction -- man.

Since 1902, real forest protection has been increasing in importance, though it is still restricted largely to minor campaigns of eradication of such pests as mistletoe, barberry, etc. Fire protection, insect invasion control, etc., are still in an early stage of development.

One rather typical Swiss forest protection measure was a campaign carried out against telephone and electrical line workmen who "wanted to cut the pretty trees" along line right-of-ways. Though this is perhaps going a little out of the way to ridicule the Swiss character it indicates how their minds too often trend. For at the same time that they have plumbed the depths of regulation of human beings, they often disregard the importance of less obvious natural phenomena.

One outstanding exception to the above generalization is their program of water control. Here, again, they have become obsessed with an idea and have carried the program out to a really remarkable degree -- in this case highly commendable. Reforestation, dam building, terracing, etc., have really been exploited to the limit.
Today, the annual number of avalanches is but a small fraction of what it was fifty years ago, while floods are almost non-existent.

The actual work of managing the protection forests, enforcing the regulations, reforestation, road building, etc., is carried out by the Cantons, subject to federal approval and assisted by federal financial help (Article XLVII). There are, of course, many minor aspects of the protection forests not brought up here, but the general principle is to regard the forest primarily in its arboreal form — i.e., as a forest and not as a stand of timber. Financial considerations are secondary and logging is carried on only where and when it is not detrimental to the primary purpose. In fact, some protection forests are permanently closed to any form of commercial use, though in most cases these are alpine forests and of little commercial value.

Public Forests

In addition to the controls over both public and private protection forests given to the Cantons, as described in the preceding discussion, they are made responsible for all public non-protection forests in Article XVIII. Article XIX goes on to place the ultimate responsibility in the federal government by making all cantonal actions and inaction subject to federal control.

The effect of these two articles is not only to place federal reins on active cantonal forest departments, but to give the federal government a whiplash to use on inactive ones. For use in both
capacities, standardization of procedures and instruction to the weaker and less imaginative cantonal departments, the Federal Inspectorate has set up the following instructions to serve as a minimum base for forest planning:

A. To begin with, a plan of all the forest areas in the Canton shall be drawn up to give for each area:

1. A short account or history of its development, uses, political status, etc.

2. Size.


4. Situation relative to towns, railroad stations, etc.

5. Altitude and exposure.

6. Climate, including floral region, temperature ranges, character of seasons, weather fluctuations, etc.

7. Physiography and character of soil.

8. Vegetation — trees, underbrush, ground cover.

9. Previous services — management plans, cutting, road building, administration, etc.


11. Estimate of timber values and costs of harvesting and transportation to mill.

12. Map of area.

B. The areas shall then be 100 per cent cruised, with all stems 16 cm. (6.3 inches) and over tallied according to species. Volumes shall be computed in cubic meters.

C. Next, each area shall have its annual increment derived
for use in computing taxes, annual cut, stand improvement, etc. Charts and tables shall be kept showing each of these, together with the annual increment and total volumes.

D. Ripe and overripe trees shall be marked for cutting. However, this cutting will not be accelerated beyond the set annual cut. (It should be understood that all cutting is done selectively.)

E. Between cuttings, the work of restocking, site improvement, road building, etc., shall be promoted.

F. In the course of time a reserve of 5-10 per cent of the total annual income shall be built up for use in emergencies.

G. A plan for future management shall be drawn up to show:
   1. Rotation and cutting cycle to be followed for the next 20 years.
   2. Estimated wood yields according to species for the next 20 years, divided into two 10-year periods.
   3. Transportation plans.
   5. Reforestation of both natural and exotic species.
   6. Cleaning and refining through control of reforestation.
   7. Trends of future yields and controls to promote proper proportion between structural timber and firewood yields.
   8. Drainage and water control plans.
   10. General outlook and view of plans past the 20-year period.
11. Provision for revision of management plans at least once every 10 years.

H. Woodlands that through established management practices fall into a natural unit shall be treated as a common class.

I. The areas shall then be divided and grouped according to natural characteristics and road systems. These groups shall be maintained as working units for computation of taxes, future planning, etc.

The federal government keeps a strict inspection system over the protection forests but leaves most of the carrying out of these plans in the non-protection forests to the integrity of the Cantons. They are also urged to bring private non-protection forests into accord with the planning and management of the public forests as much as possible.

One rather interesting sidelight typical of the management problems of Swiss public forests is the regulation of the cutting in the community forests. As noted before, each member of the community receives a share of the annual production, usually taken in the form of firewood. Formerly, each man was told how much wood he was supposed to receive for the year and the cutting and judging of volume left up to him. This naturally resulted in some wide discrepancies and in the chopping up of much fine cabinet wood and structural timber to make kindling. To control this, a federal law was passed in 1902 giving the cantonal foresters the authority to designate the cutting and utilization, manner of felling, and judgment of cubic content of trees in community forests.
Private Forests

Thirty per cent of the total forest area of Switzerland is in private ownership. Most of this is in the Swiss Plateau (an area of agricultural land lying between the Alps and the Jura Mountains), the foothills of the Alps, and the Jura Mountains (a low range, lying along the Swiss-Franco border). While the law requires all woodlands of 60 acres and over to be separated from the general land area and placed under proper management, most of these private woodlands are in the form of farm woodlots and fall far below that size. They average about 3.7 acres in size.

Those classified as protection forests are subject to the same strict supervision and management as the public forests. All cutting must be approved by the cantonal foresters. Clear cutting is strictly forbidden, and they are subject to immediate closure upon any violation of regulations or on occurrence of any natural catastrophe.

The amount of regulation imposed on non-protection woodlands varies from Canton to Canton, it being largely a cantonal matter. However, they are still subject to the federal laws where applicable, such as the regulation that the forest area of Switzerland cannot be diminished (Article XXXI), and requirement of maintenance of proper stocking (Article XX) and proper restocking of annual cut (Article XXXII). In addition to these basic requirements, the silvicultural management of the lands is supposed to be handled by the cantonal foresters. The scattered nature and small size of the areas often
make direct management rather difficult, however. To combat this, the Federal Inspectorate encourages and promotes the grouping together of all small private woodlots to form large forests better suited to common management (Article XXVI). It offers to pay up to one-half of the cost of such projects (Article XLII). The Cantons are expected to furnish the plans and management for the project (Article XXVI).

Many Cantons have gone much further than the minimum requirements of the Federal Law by outlawing all clear cutting and overcutting. Most aid in the rejuvenation of private forests destroyed by natural catastrophies and regulate and subsidize road building and maintenance, restocking, dam and terrace building, etc.

During the course of time there has been some debate over the right of the government to regulate the management of private forests. This was especially true at the commencement of the program being carried out by the present law. However, the character of modern Swiss thought has subdued this concept and today the right of the government to directly manage the forest lands of the private individual is seldom questioned.

Education

By requiring in Article VII that the Cantons maintain adequate staves of properly trained foresters, the federal government has indirectly assumed responsibility for making available a proper education in forestry. The principal instrument of education is the
Forestry School in the Federal Polytechnical Institute at Zurich, originally founded in 1855 as the result of the activities of the Swiss Forest Association.

In order to insure that its foresters are well trained, the Inspectorate requires all candidates for public positions to have graduated from the school and to pass a theoretical examination given by it. It also requires them to spend one year of apprenticeship under the surveillance of a member of the Federal Commission for Forestry. During this year the candidate is given more direct training in the practical work of forestry and is observed for traits of personal economy of the forest in regards to the rational management of stock to provide healthier stands. It is largely upon this character of personal thrift that Swiss foresters are judged.

If at the end of this year the candidate receives the approval of the committee, he is given a practical examination by the Federal Inspectorate. Not until he has satisfactorily completed all of these requirements is the candidate eligible for appointment.

Besides the regular forest school, the Federal Inspectorate also carries on less formal courses varying from two weeks to two months in length. They are designed especially for the cantonal under-foresters and men of non-professional status, such as the forest guards, private caretakers, etc. It also promotes occasional special study trips and specialized courses.

In order to promote forest education, the federal government subsidizes students at both the Forestry School and in the shorter courses
(Article XLI). It also pays set annual bonuses to all men engaged in forestry who have completed any of the shorter courses, as well as paying a fixed percentage of the salary of any forester holding a diploma in technical forestry from the Forest School (Article XL). This includes all foresters — corporation, community, etc.

While the training of the cantonal under-foresters is supposedly the direct responsibility of the Cantons (Article IX), most of it is carried on through these federally financed and directed schools. Cantonal education means are fairly well limited to direct on-the-job training.

Miscellaneous Public Services

Forest Statistics. One of the minor responsibilities of the Federal Inspectorate is the accumulation, preparation and publication of the "Swiss Forest Statistics". They include:

1. Figures of national wood yields and wood uses, including substitutes for firewood, such as charcoal, coal, peat, etc.

2. Figures of wood import and export, both raw and worked.

3. Figures of wood transportation and wood commerce within Switzerland and within the adjoining countries insofar as the relations with the latter are of commercial importance.

4. Reports of damage to forests by fire, storms, insects, etc.
Surveying. Articles XIV, XV, and XVI cover the surveying of public forests, placing responsibility for that service on the Federal Inspectorate, but leaving the actual work of surveying to the Cantons. They also set up instructions covering minimum requirements and authorize monetary subsidization of the work.

Herbarium. Another minor job assigned to the Inspectorate is the formation and maintenance of a herbarium and the work of identifying and classifying the plants of Switzerland. The herbarium was founded in 1898 with 150 acres. It grew to 820 acres by 1901, but has since been reduced to about 475 acres.

National Park. In 1911 a federal commission was set up and provided with a yearly allotment for the building and maintenance of a National Park. The park has been located in the eastern tip of the country. Its purpose is to act as a preserve for all forms of wildlife; to preserve rare forms of plant and animal life in a virgin form for the future education of mankind.

Besides the Herbarium and the National Park, there are several "Alpine Gardens" run by various societies and organizations which are granted federal aid and which help to preserve the wild life, both floral and fauna.

Another part of the preservation program is the regulation of hunting and fishing seasons by the forest police under federal control. Several species, especially mountain animals, have been saved from extinction by the vigilance of the forest service. It has also
imported and bred animals, both to build up depleted stocks of native wildlife and to introduce exotic species.

Besides being charged with these protection measures, the Inspectorate has the duty of observation and cataloging of birds and animals and the participation in various national and international congresses, such as the Ornithological Congresses; education, especially child education; and the publication of bulletins and reports on wildlife.

This concludes the investigation into the development and function of public forestry in Switzerland. Many details have been omitted, but enough have been included to indicate the thoroughness of government regulation and control; the completeness of the nationalization of the forest resources. The term "nationalization" generally means the complete taking over of ownership and management by the government. In Switzerland the government has taken over only the management, leaving the ownership in its original status except where that ownership refuses to acknowledge government management. Thus we have a state of semi-nationalism, somewhat unwieldy, but quite possible in a country the size of Switzerland.
APPENDIX

The following are a few statistics on Swiss forests (1945):

Area of Switzerland 10,202,759 acres
Forest Area 2,291,853 acres (22%)

Ownership
State 5%
Community and Corporation 65%
Private 30%

Classification
Protection (Mountainous) 75%
Non-protection (Plateau) 25%

Type
Softwood 70%
- Spruce 45%
- Pine 25%
- Larch 20%
- Fir 10%

Hardwoods 30%
- Beech 90%
- Miscellaneous 10%

Yields cubic meters per acre
State Forests 19.2
Community Forests State Managed 18.2
Community Forests Not State Managed 13.1
Average of all Public Forests 14.0
**Utilization Total Yield**

<table>
<thead>
<tr>
<th></th>
<th>100%</th>
<th>State</th>
<th>Community</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Utilization</td>
<td></td>
<td>98.6%</td>
<td>84.5%</td>
</tr>
<tr>
<td>Lumber and Pulp</td>
<td></td>
<td>41.4%</td>
<td>39.3%</td>
</tr>
<tr>
<td>Firewood</td>
<td></td>
<td>58.6%</td>
<td>60.7%</td>
</tr>
<tr>
<td><strong>Average Yearly Cut-over</strong></td>
<td></td>
<td></td>
<td>(Area)</td>
</tr>
<tr>
<td>State Forests</td>
<td></td>
<td>70.3%</td>
<td></td>
</tr>
<tr>
<td>Community Forests State Managed</td>
<td></td>
<td>58.4%</td>
<td></td>
</tr>
<tr>
<td>Community Forests Not State Managed</td>
<td></td>
<td>63.8%</td>
<td></td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td></td>
<td>63.5%</td>
<td></td>
</tr>
</tbody>
</table>

**Utilization Income from Forests**

<table>
<thead>
<tr>
<th></th>
<th>7.7%</th>
<th>66.4%</th>
<th>7.0%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forest Personnel</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Logging and Transportation Costs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roads</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Reforestation</td>
<td>4.3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water and erosion control</td>
<td>0.7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insurance</td>
<td>5.1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>7.7%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Reforestation in 1945**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>17,000,000</th>
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</thead>
<tbody>
<tr>
<td>Total Trees Planted</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Restocking</td>
<td>15.5 MM</td>
<td></td>
</tr>
<tr>
<td>Afforestation</td>
<td>1.5 MM</td>
<td></td>
</tr>
<tr>
<td>Seeds Planted</td>
<td></td>
<td>13,000 Kg.</td>
</tr>
</tbody>
</table>

**Annual Swiss Wood Consumption**

- 1.25 m^3/person family
- 5 m^3/family

of which 62% is for firewood

38% lumber and pulp
BIBLIOGRAPHY

Federal Publications

1. Aus Der Tätigkeit Der Eidgenössischen Inspektion für Forstwesen, Jagd, und Fischerei. Herausgegeben aus Anlass der Schweizerischen Landesamstellung in Zurich. 1939.

2. Bericht des Eidgenössischen Oberforstinspektorates on das Eidgenössische Departement des Innern betreffend Bundesbeiträge an die Besoldungen des untern Forstpersonals. 1 September, 1903.


11. Zum Funfzigjährigen Bestehen der Eidgenössischen Inspektion für Forstwesens, Jagd, und Fischerei. 1926.
Cantonal Publications


Private Authors


Personal Interviews
