

THE HISTORY OF FORESTRY IN AMERICA

W. N. SPARHAWK

The history of forestry in the United States can be divided into five periods.

The first, the colonial period ending in 1776, was characterized by a gradual pushing back of the forests to make room for settlement, nearly all east of the Allegheny-Appalachian Range.

The second period, from 1776 to the beginning of forestry work in the Federal Department of Agriculture, lasted just 100 years. This was a period of forest exploitation, gradual at first, but rapidly increasing after about 1850.

The following 21 years, also a period of accelerated exploitation, was marked by the campaign of public education and propaganda that finally led to the establishment of a forestry policy for Government timberlands in 1897.

From 1897 to 1919 was the period of development of the national forest system and the establishment of a forestry profession. The movement for conservation of natural resources in general also took shape early in this period.

Finally, the period since 1919 has been marked by an increasing emphasis on private forestry, both in legislation and in the policies of the forest-land owners themselves.

Several salients stand out in the story of how forestry and the country grew up from a spoiled, wasteful childhood to rational adulthood. In its broad outline, forestry in the United States is evolving in much the same way as it did in Europe, but much faster. Forestry in America has not caught up with forestry in the more advanced European countries, but we have come a long way in our brief period as a Nation, and the progress we have made came not from slavishly copying the European pattern; American forestry, as it grows to maturity, tends more and more to become indigenous.

DURING THE COLONIAL PERIOD, wood was a necessity, but it was overabun-

dant and free for the taking. The forests harbored Indians and wild beasts and encumbered the ground needed for crops and pastures. So the pioneers, in the words of Gifford Pinchot, "came to feel that the thing to do with the forest was to get rid of it."

Local wood shortages sometimes arose near the larger towns despite the abundant supplies, because transportation facilities were poor. This occasionally led to restrictions on cutting, until the timber farther back could be opened up. Timber export from New England began with or before the first settlement—masts and hand-made staves, clapboards, and shingles at first, and later sawn lumber, staves, and ship timbers. These commodities formed the basis of a thriving trade with the West Indies and with Europe. The English Government, anxious to insure a supply of masts for the Royal Navy and to prevent other countries from getting them, attempted to reserve all white pine trees that were suitable for masts, but succeeded only in arousing the resentment of the colonists. These and similar ordinances and regulations were essentially police measures for the protection of town and crown property, and had nothing to do with forestry.

Perhaps the best-known attempt at forest conservation during the colonial period was William Penn's provision, in 1681 or 1682, that an acre should be maintained in forest for every five cleared in lands granted by him. So far as known, this provision was not long enforced.

IN THE FIRST CENTURY of independence, settlement spread over most of the country. Transcontinental railroads were built. Wooden ships were on their last voyages. The westward migration had already caused the abandonment of many farms in the Northeast and the Southeast. Most of the old-growth

white pine of New England had been cut; that in New York and Pennsylvania was going fast. Pine production in the Lake States was approaching its peak. It was still the favored species for lumber, for the sawmill output of white pine exceeded that of all other species combined.

At the beginning of the nineteenth century, concern was felt over local shortages of firewood and other timber near the cities and over the supply of ship timbers. In 1791 the Philadelphia Society for the Promotion of Agriculture offered medals for planting locust for posts and treenails. The Massachusetts Society offered premiums for growing trees, in 1804. The New York Society named a committee to study the "best mode of preserving and increasing the growth of timber." That or another committee, in a report in 1795, recommended that inferior agricultural land be devoted to trees. In 1817 the Massachusetts Legislature asked its State Department of Agriculture to encourage the growing of oaks for ship timbers; in 1837 it authorized a survey of forest conditions in the State, with the idea that the findings might induce landowners to consider the importance of "continuing, improving, and enlarging the forests of the State."

In 1799, the Congress, heeding John Jay's warning that ship timbers and masts would become scarce unless steps were taken to prevent waste and preserve the existing supplies, authorized President Adams to spend \$200,000 to buy reserves of live oak on the South Carolina and Georgia coasts. That was probably the first appropriation by the Federal Government for acquisition of timberland.

It was followed several years later by acts authorizing the President to reserve public lands bearing live oak and cedar in Florida, Alabama, and Louisiana; to purchase similar lands; to conduct experiments in the planting and cultivation of live oak (probably the first Federal forestry research); and to take appropriate measures to

prevent depredations and preserve live oak stands. Besides the small areas bought in Georgia, some 244,000 acres was reserved in the Gulf States. Meanwhile, stealing of timber from the reservations and other public lands went on unchecked, and the Government continued to sell oak timberland at \$1.25 an acre and buy stolen oak timber for \$1.50 a cubic foot. The Louisiana reservations were canceled in 1888.

In 1831 Congress prohibited cutting live oak and other trees on naval reservations or any other lands belonging to the United States. Although seldom enforced, the act remained for almost 60 years the basic and only law aimed at protecting the timber on Government lands. The Commissioner of the General Land Office attempted to enforce the law in 1851, but was dismissed for doing so. Carl Schurz tried again when he was Secretary of the Interior, but was stopped by Congress in 1880.

After the Civil War, citizens began to take more interest in forests; earlier they generally were indifferent to them. The heavy requirements for wood during the war and the extensive destruction in some areas by military operations, the rapid pace of lumbering in the Lake States and the widespread destruction by forest fires, the growing realization of the relation of forests to stream flow and water supplies—all caused people to think about future timber supplies and the importance of forest cover.

A paper by the Reverend Frederick Starr, in the report of the Department of Agriculture for 1865, is said to have had great influence on the forestry movement. He predicted a timber famine within 30 years and advocated the immediate undertaking of carefully planned research on how to manage forests and how to establish plantations. The research, he maintained, should be done by a Government-endowed private corporation in order to avoid the evils of the spoils system, frequent changes in personnel, and

general corruption in the Government. That, more than likely, was the start of the movement for better forest management.

What may have been the first State commission appointed to inquire into the forest situation and recommend a forestry policy for the State was set up at the request of the Wisconsin Legislature in 1867. The resulting report, by I. A. Lapham, failed to emphasize the need for sustained-yield management of the existing forests and overstressed the need for planting, but demonstrated clearly the relation of forests to stream flow. No action was taken on the report.

Maine appointed a commission on forestry policy in 1869, but the result was some relatively unimportant laws.

A New York commission set up in 1872 investigated the question of preserving the Adirondack forest for its effect on the Hudson and other rivers and the Erie Canal. No action was taken at that time.

From 1868 on, tree planting caught the public attention and interest. A number of States enacted laws to encourage planting by offering bounties or by granting tax reductions or exemption. Arbor Day was first celebrated in Nebraska in 1872, at the instigation of J. Sterling Morton, later Secretary of Agriculture. Several railroad companies planted trees for ties and timber, mostly in the Great Plains.

The Timber Culture Act, passed by Congress in 1873, offered land free to settlers who would plant trees on 40 (later reduced to 10) acres of each 160-acre claim.

Opinions differ as to the efficacy of the measures. One estimate is that 2 million acres was planted under the act of 1873. Others report that most of those plantations were neglected and died, so that perhaps not more than 50,000 acres could be considered successful. Most of the State laws are reported to have accomplished little, though Governor Morton told the American Forestry Congress in 1885 that Nebraska had more than 700,000

acres of planted trees. B. E. Fernow, in his *History of Forestry*, suggested that Arbor Days may have retarded real forestry by centering attention on planting, to the exclusion of the proper use of existing forests, and by introducing poetry and emotional appeal instead of practical economic considerations.

The first systematic effort to arouse public interest in the preservation and conservative use of the natural forest areas—as distinct from planting of artificial forests—was instigated by Franklin B. Hough's address before the American Association for the Advancement of Science in 1873.

The speech led the Association to send to Congress and to the State legislatures, in 1874, a memorial that said:

“The preservation and growth of timber is a subject of great practical importance to the people of the United States, and is becoming every year of more and more consequence, from the increasing demand for its use; and while this rapid exhaustion is taking place, there is no effectual provision against waste or for the renewal of supply. . . . Besides the economical value of timber for construction, fuel, and the arts . . . questions of climate . . . the drying up of rivulets . . . and the growing tendency to floods and drought . . . since the cutting off of our forests are subjects of common observation. . . .”

The Association asked Congress to create the position of Federal Commissioner of Forestry, whose duties would be to ascertain (1) the amount and distribution of woodlands in the United States, the rate of consumption and waste, and measures necessary to insure adequate future supplies of timber; (2) the influence of forests on climate, especially in relation to agriculture; and (3) the methods of forestry practiced in Europe.

THE YEARS FROM 1876 TO 1897 brought a growth in national and State fire-land policies. The Agriculture

appropriation bill enacted in 1876 contained a rider on the section dealing with free seed distribution, which authorized the Commissioner of Agriculture to appoint, at a salary of \$2,000, "a man of approved attainments and practically well acquainted with the methods of statistical inquiry" to investigate and make a detailed report on forestry.

Dr. Hough was appointed to the new position, and his three voluminous reports, published in 1877, 1880, and 1882, contained much significant information on American forests and the forest-products industries and on European forestry.

A fourth volume was contributed in 1884 by N. H. Egleston, who succeeded Hough in 1883. At that time the Division of Forestry, which had been formally established in 1881, consisted of the Chief and three field agents, and received an appropriation of \$10,000.

Both Hough and Egleston, and the Commissioners of Agriculture, were active in the work of the American Forestry Association and the American Forestry Congresses. The Association was organized in Philadelphia in 1876 for the purpose of "protection of the existing forests of the country from unnecessary waste, and the promotion of the propagation and planting of useful trees." In calling the preliminary organization meeting in 1875, John A. Warder stated as one objective of the proposed association, "The fostering of all interests of forest planting and conservation on this continent." The term "forest conservation," therefore, was in use more than 30 years before it was taken up and popularized by Gifford Pinchot and Theodore Roosevelt.

The Association was not very active, but took on new life in 1882 when it merged with the American Forestry Congress, organized earlier that year on the occasion of a visit by Baron von Steuben, a Prussian forester and descendant of the general who helped defeat Cornwallis at Yorktown.

The constitution of the merged association, drafted under the leadership of B. E. Fernow, specified as its objectives "the discussion of subjects relating to tree planting; the conservation, management, and renewal of forests; the climatic and other influences that affect their welfare; the collection of forest statistics; and the advancement of educational, legislative, or other measures tending to the promotion of these objects."

The new organization met one or more times each year and was active in drafting proposals for both State and Federal legislation. At a meeting in 1886 in Denver, two resolutions were adopted:

"That the public lands at the sources of streams, necessary for the preservation of the water supply, should be granted by the General Government to the several States, to be held and kept by such States in perpetuity, for the public use, with a view to maintaining and preserving a full supply of water in all rivers and streams."

"That fire is the most destructive enemy of the forest, and that most stringent regulations should be adopted by the National and State and Territorial governments to prevent its outbreak and spread in timber stands."

Largely through the influence and encouragement of the American Forestry Congress, several local or State associations were formed; they were responsible for the formulation and enactment of a number of State forestry policies.

Colorado was the first State to make provision for management of its forest lands. Its constitution, adopted when it was admitted to the Union in 1876, directed the legislature to provide for protection and management of State forest lands. Nothing was done until 1885, when a Forestry Commission was created, but the Commission was active for only a few years. The Colorado Constitutional Convention also asked Congress to turn over control of Federal forest lands to the States and Ter-

ritories in regions where irrigation is necessary, for the reason that the existing system of public-land disposal, if continued, would injure Colorado and "bring destruction and calamity upon the entire population of the so-called Far West." No action was taken on the recommendation.

In California, also, a State Board of Forestry, established in 1885, urged in its first report that all Federal and State timberlands not fit for agriculture be permanently reserved and put in charge of forestry officers. In 1888 a resolution of the legislature asked Congress to stop disposing of Federal forest lands in California and to preserve them permanently for protection of watersheds.

New York, in 1883, carried out the recommendations made 11 years earlier and stopped the sale of tax-reverted forest lands in the Adirondacks. In 1885 a Forestry Commission was set up, with an appropriation of \$15,000, to organize a State forest-protection system and administer the State's forest reserve, the primary object of which was the protection of water supplies, not timber production. Suspicion soon arose that the Forest Commissioners were working for the interests of the lumbermen, so a constitutional amendment in 1894 prohibited the cutting of timber and required that the reserve be kept forever in a wild condition.

Pennsylvania created a Division of Forestry in its Department of Agriculture in 1895 to collect and publish information on forest resources, enforce the fire laws, give advice on forestry, compile statistics on timber production and consumption, and manage all forest lands belonging to the State. In 1897 provision was made for purchase of tax-delinquent forest lands, to establish "a forestry reservation system having in view the preservation of the water supply at the sources of the rivers of the State, and for the protection of the people of the Commonwealth and their property from destructive floods." Another law in 1897 directed the com-

missioner to recommend to the Governor or the legislature three forest reservations of not less than 40,000 acres each, on the headwaters of the Ohio, Delaware, and Susquehanna Rivers, to be acquired by purchase. By 1910 the State had acquired more than 900,000 acres under these acts.

At the time that Western States were urging the reservation of public lands and when the Forestry Congress proposed their transfer to the States, the Federal Government had made no move to withhold them from disposal and only occasional gestures to protect them from fires and depredation.

Carl Schurz, Secretary of the Interior from 1877 to 1881, repeatedly, but vainly, urged the reservation of all public-domain timberlands and their protection and conservative management. Numerous bills looking to this end were introduced in almost every Congress from 1876 on.

Finally, in 1891, largely on the insistence of Secretary of the Interior Noble, a rider, which Gifford Pinchot called "the most important legislation in the history of forestry in America," was attached to an act amending the land laws. It authorized the President to reserve forest lands of the public domain, whether bearing commercial timber or not, in any State or Territory having Federal land. President Harrison acted promptly and proclaimed the first reserve, the Yellowstone Park Timberland Reserve, on March 30, 1891. This was the beginning of the national forest system. More reservations followed by President Harrison and then by President Cleveland.

Congress failed to provide, however, for the protection and administration of the reserves, nor was there any legal way in which timber could be sold or forest management applied. Timber thieves and graziers continued to operate without restriction. Bills were introduced in each Congress to remedy the situation. In 1894 the McRae bill, drafted by B. E. Fernow, Chief of the Division of Forestry since 1886, was

passed by both Houses but too late for agreement in conference. This bill was passed again by the House of Representatives in 1896, but not by the Senate. Meanwhile, through efforts of the American Forestry Association, Secretary of the Interior Hoke Smith in 1896 was induced to ask the National Academy of Sciences to study and report on the problem.

After a trip to look over the situation in the West, the Committee set up by the Academy, being unable to agree on recommendations for administration of the forests, merely recommended the establishment of some 21 million acres of new forest reserves. In order to act before his term expired, President Cleveland proclaimed these reservations without the customary consultation with local people and Members of Congress. His act aroused opposition throughout the West, especially because it merely locked up the resources without provision for their use, and Congress suspended temporarily all but two of the reservations.

However, the act suspending the reservations (the Sundry Civil Appropriation Act of June 4, 1897) carried an amendment by Senator Pettigrew that provided for administration and management of existing and future reserves, much as proposed in the McRae bill of 1894. This amendment is the charter on which the operation of the national forests has been based.

Among its important provisions is a statement of objectives:

"No public forest reservation shall be established except to improve and protect the forest," secure "favorable conditions of water flow," and "furnish a continuous supply of timber for the use and necessities of citizens of the United States." The principal specifications regarding administration and use of the reserves are the instructions to the Secretary of the Interior to make provision for protection against fire and trespass; to make rules and regulations for occupancy and use of the reserves and their products; to sell,

after due examination and appraisal, dead and mature timber; and to allow free use of timber by bona fide settlers and others for their domestic needs.

Management of the public forests—and of private forests, too—required more than legislative authority and appropriations. Without an adequate basis of scientific knowledge (meaning research) and an adequate staff of technical foresters (meaning a forestry profession), good forest management would be impossible.

As Fernow told the American Forestry Congress in 1885:

"Generalities on forest preservation or forest destruction and forestal influences have become trite and their constant reiteration without positive data will dull the interest of listeners and readers, create suspicion and defection. We need definite, well-authenticated local observations, arrived at by well-described scientific methods; we need methodical work in establishing the conditions of growth for different species, their behavior towards the soil and towards each other in different soils, their rate of growth at different periods of life under different conditions. In fact, besides making propaganda, we should by concerted effort establish the principles upon which the forestry we advocate is to be carried on."

Unfortunately, the Division of Forestry in the Department of Agriculture, during its first 20 years, found itself unable to carry on much scientific research in the woods, because it controlled no forest land, could not get permission to use public timberlands or military reservations, and was not allowed to use the private lands for fear of criticism that public money was being used for the benefit of private individuals.

The States were repeatedly urged by Fernow and his predecessors, speaking through the forestry associations and congresses, to undertake forestry research at their land-grant colleges and experiment stations, but the result appears to have been small. The Division cooperated with the State agricultural

experiment stations in a few experiments, mainly in planting, including experimental planting in the Nebraska Sand Hills and cultivation of cork oak from imported acorns. Monographs were prepared, by the botanists rather than foresters, on several important timber trees.

The greater part of the Division's activity between 1886 and 1898 was devoted to forest-products research, which Fernow believed would encourage better and more economical use of wood and reduce waste, and would make industrial and other timber owners take an interest in conservation of timber resources. Among the subjects investigated were the use of chestnut oak as a substitute for white oak railroad ties, the use of metal ties to replace wood, tannin content of chestnut and other woods, strength properties of turpented pine (until then considered inferior to unbled timber), blue stain of southern pine and yellow-poplar lumber, and timber physics.

Regarding the need for trained foresters, Hough's paper on "Forestry Education," presented at the American Forestry Congress in St. Paul in 1883, is illuminating. He believed that lectures on the importance of forests should be given in all primary and secondary schools, but he saw no need for technical training in forestry. Noting a proposal for a Federal forestry school in St. Paul, he asked where the graduates would find employment, and said:

"Neither the general nor the State governments have any systems of forest management needing their services. There may be a few railroad companies who would employ one, but this is not certain, and as to private estates, I know of none upon which such a person would be likely to find an engagement. . . . We do not for the present, and perhaps for many years to come, require a class of persons who have been specially trained to the degree that is deemed necessary in the better class of forest schools in Europe, because such persons could not find

employment either in charge of public or private forests at the present time. . . ."

It should be noted that neither Hough nor Egleston had any technical knowledge of forestry except what they may have picked up in the course of their work. Fernow was the first technically trained forester in Government service but, as he admits, he was at a disadvantage because he was "a foreigner who had first to learn the limitations of democratic government."

Partly as a result of urging by the forestry associations and the reports of State commissions of inquiry, forestry instruction was introduced into the curricula of many of the land-grant colleges beginning about 1883. There is some difference of opinion as to which was the first to include such a course, but there was one at Iowa State College in 1883, in 9 or 10 institutions by 1887, and in some 20 by 1898.

During the last two decades of the nineteenth century, there were frequent expressions of concern over depletion of timber supplies in the East. Manufacturers frequently complained of difficulties in getting supplies of ash, hickory, white oak, walnut, and high-grade white pine—the same species that we hear about in 1949. In 1883, George Loring, then Commissioner of Agriculture, stated that white pine was nearly gone in New Hampshire and New York, and going rapidly in the other Northeastern States; that only 10 to 20 years' supply remained in the Lake States, and that eastern spruce was nearly exhausted. In 1887 it was reported that shiploads of pine were coming into the United States from Russia. In 1889 Professor Prentiss of Cornell predicted that hemlock, "the most valuable tree east of the Mississippi, except white pine," would be exhausted in 20 to 30 years at the current rate of cutting. Evidently southern pine was not well thought of in the New York market at that time.

In 1890 Fernow reported to the American Forestry Congress: "While

the area of forests in the United States probably does not diminish now as it used to, the value of the remaining area is very rapidly depreciating, not only by removing the accumulated supplies, but by cutting the best and leaving the inferior material, by neglecting to give attention to the reproduction of the better kinds, or even by recurring fires destroying the capacity for such reproduction."

In 1892 Fernow expressed regret that the funds were inadequate for testing all of the important woods, because there was considerable demand for tests of species which, though "still more or less unknown . . . are now being drawn upon to eke out the deficiency of supply of the better-known kinds." Those unknown species included Douglas-fir, cedars, sugar pine, and baldcypress.

As another evidence of the concern felt by some members of the industry over waning timber supplies, there may be mentioned the paper presented by H. C. Putnam, a Wisconsin lumberman, which called for action by Congress for protection against fires and protection of young trees in logging—both to insure a future timber supply and to protect stream flow.

The accomplishments of the forestry movement prior to 1898 have been criticized on the ground that there was much forestry in words but none in the woods. It is important to realize, however, that without the many years of propaganda, of learning and informing at least part of the public regarding the facts of the forest situation and the need for doing something about it, the conservation movement of the early 1900's would likely have been a dud. It is necessary to remember, also, that there were almost no trained foresters to carry forestry into the woods before 1898. The Division of Forestry and the associations not only were successful in stimulating public interest in forestry problems, but they had a large share in developing public forestry policies and in drafting basic legislation, both Federal and State. As

Fernow said, in his Report upon Forestry Investigations, 1877-98:

"To have established the conception that forestry, silviculture, and forest preservation are not the planting of trees, but cutting them in such a manner that planting becomes unnecessary, is one of the most potent results of the efforts of the Division of Forestry. . . . For preservation, it must by this time have become clear, does not consist in leaving the forests unused, but in securing their reproduction."

Pointing out that by 1898 the lumber-trade journals gave respectful hearing to the advocates of forestry whom they had ridiculed as "denudatics" only 12 years before, Fernow goes on to say:

"The time has come when it [the Division] should not only more vigorously pursue technical investigations, but when it should have charge of the public timberlands, and especially the public forest reservations, which will never answer their purpose until controlled by systematic management. . . . A Division of Forestry in a government which has reserved millions of acres of forest property must logically become the manager of that forest property."

BETWEEN 1897 AND 1919, the national forest policy developed.

As directed by the act of June 4, 1897, the Secretary of the Interior immediately undertook to provide for the protection and administration of the forest reserves. The task was assigned to the General Land Office, which appointed a field force of forest superintendents, rangers, and others, and an office staff in Washington. None of them had any technical knowledge of forestry, and it was not until 1902—when a tentative arrangement for the Bureau ("Division" until 1901) of Forestry in the Department of Agriculture to handle the forestry work on the reserves fell through—that the General Land Office set up its own technical forestry division. Filibert Roth was put in charge of the work. He borrowed several men from the Bureau of

Forestry, but he stayed only a year and then left to head the forestry school that was being established at the University of Michigan.

Meanwhile, Dr. Fernow had left the Government service in 1898 to organize the school of forestry at Cornell. The only other systematic instruction in forestry at that time was the elementary instruction given at some 20 land-grant colleges and the short course offered at Biltmore, N. C., by C. A. Schenck, a German forester.

Gifford Pinchot succeeded Fernow as Chief of the Division of Forestry in 1898. He undertook to introduce better forestry methods into the operations of the private owners, large and small, by helping them make working plans and by demonstrating good practices on the ground. There were then only two technical foresters and nine other employees on the staff of the Division, and probably fewer than a dozen foresters in the country. Accordingly, a start toward building up a profession was made by recruiting student assistants who had an inclination and aptitude for forestry and who would supplement academic work with field experience in the Division. In order to provide a high grade of forest training suited to American conditions, the Pinchot family provided an endowment for a 2-year postgraduate school at Yale University. H. S. Graves and J. W. Toumey were released from the Division in 1900 to start the school. In the fall of 1900, the Cornell school had 24 students, Biltmore 9, and Yale 7. (In 1946 there were some 6,000 American-trained professional foresters.) During the next few years schools or departments of forestry were organized at the University of Michigan, Harvard, University of Nebraska, Mont Alto, Pa., Pennsylvania State College, and elsewhere.

In 1900, under Pinchot's leadership, the Society of American Foresters was founded. It had seven charter members. The objects of this professional society are: "To further the cause of forestry in America by fostering a

spirit of comradeship among foresters; by creating opportunities for a free interchange of views upon forestry and allied subjects; and by disseminating a knowledge of the purpose and achievements of forestry."

In 1901 the newly christened Bureau of Forestry was given broader authority to make working plans for private owners, and much larger appropriations than had been available to the Division. The forest-products research that had been stopped shortly before Fernow left was resumed, along much the same lines as before. In 1910 the products work was centered at the Forest Products Laboratory, operated in cooperation with the University of Wisconsin at Madison. In 1902 the earlier experimental planting in the Nebraska Sand Hills was followed up by reservation of part of the area and planting on a fair scale.

The unsatisfactory situation in which the Federal forest reserves were administered, in a different department from that in which the Government's technical forestry work had been established, rapidly became a major issue. Theodore Roosevelt's first message to Congress in 1901 and the report of a commission on the organization of Government scientific work in 1903 reiterated earlier proposals that all responsibility for the reserves be transferred to the Department of Agriculture. Secretary of the Interior Hitchcock also supported the proposal. Finally, a special American Forestry Congress met in Washington in January 1905 for the specific purpose of bringing about the transfer. The meeting was sponsored by the Secretary of Agriculture, the heads of the Geological Survey, Reclamation Service, and General Land Office, the president of the National Lumber Manufacturers' Association, the presidents of the National Livestock and National Woolgrowers' Associations, the presidents of the Union Pacific and Great Northern Railroads, and the head of the Weyerhaeuser lumber companies. The resolutions adopted by the gathering no

doubt helped consummate the transfer, which was made by act of Congress on February 1, 1905. The Bureau of Forestry was renamed Forest Service that year, and the forest reserves were renamed "national forests" in 1907.

In a letter to Gifford Pinchot, dated February 1, 1905, Secretary of Agriculture James Wilson laid down the guiding principles. The letter read, in part:

"In the administration of the forest reserves it must be clearly borne in mind that all land is to be devoted to its most productive use for the permanent good of the whole people, and not for the temporary benefit of individuals or companies. All the resources of forest reserves are for use, and this use must be brought about in a thoroughly prompt and businesslike manner, under such restrictions only as will insure the permanence of these resources.

"In the management of each reserve local questions will be decided upon local grounds; the dominant industry will be considered first, but with as little restriction to minor industries as may be possible; sudden changes in industrial conditions will be avoided by gradual adjustment after due notice; and where conflicting interests must be reconciled the question will always be decided from the standpoint of the greatest good of the greatest number in the long run."

Activities in 1908 and 1909 can be regarded as the culmination of the early conservation movement. The White House Conference of Governors on conservation of natural resources was conducted in 1908. It set up a National Conservation Commission which, in a three-volume report (1909), presented a survey of the status of America's natural resources, including forests. Also in 1909 was held the North American Conference on Natural Resources, which served to give an international flavor to the movement.

The first decade of the twentieth century saw the most rapid growth of the national forests, which embraced

about 56 million acres in 1901, more than 100 million in 1905, and 175 million acres in 1910. After 1910 the area was gradually reduced by the elimination of almost 27 million acres that was classified as more valuable for agriculture or grazing than for forestry. This reduction was partly offset by increases through exchange with States and private owners and by acquisition of land through purchase.

Most of the forest lands reserved from the public domain were in the West, but the interest in conserving forests for protection of watersheds was almost as strong in the East, where there was little or no Federal public land. The first suggestion that the Government buy land for a forest reserve in the East was made in 1892 or 1893 by the State geologist of North Carolina. Later, an Appalachian National Park Association was formed; in 1901 it induced Congress to authorize a survey of the Southern Appalachian area proposed for a reserve. In 1900 and also in 1901 the legislatures of North Carolina, Georgia, Alabama, and Tennessee authorized the Federal Government to acquire lands for a forest reserve.

After many attempts, in which the southern interests joined forces with the advocates of a national forest in the White Mountains of New Hampshire, Congress was persuaded to enact the Weeks Law of March 1, 1911. The law provided for the purchase of forest lands on the headwaters of navigable streams, after certification by the Geological Survey that they affect navigation. The authority of this act was broadened in 1924; about 18 million acres has been purchased to date.

At the same time that the national forests were expanding in area, progress was being made in their administration and management. Six regional offices were set up in 1908 so as to bring the administration closer to the people most concerned. A systematic program of timber surveys was also adopted in 1908 to afford a basis for

timber sales and management plans.

A scientific approach to forest-fire prevention and control began in 1911 as a result of the 1910 conflagrations which burned over nearly 5 million acres and destroyed more than 3 billion feet of timber. Reforestation by planting and sowing was mostly on an experimental basis before 1911 but, by 1919, more than 150,000 acres had been covered—more than half of it by sowing and not all of it successful.

A comprehensive plan of forestry research—mainly in silviculture—was formulated in 1908 by Raphael Zon and others. Several of the experiment stations proposed in this plan were set up, and in 1915 a branch of research was established, with Earle H. Clapp in charge.

Cooperation of the Federal Government with the States to encourage fire protection on the watersheds of navigable streams was authorized by the Weeks Law of 1911. Federal contributions were to be contingent upon adequate legislation and matching appropriations by the States. In 1911 the Government spent about \$37,000, in cooperation with 11 States, to protect 61 million acres of State and private land. In 1919 the Federal expenditure was \$100,000, with 22 States cooperating and nearly 110 million acres under organized protection. In the fiscal year 1948, with an appropriation of \$9,000,000, the Federal Government cooperated with 43 States and Hawaii in protecting 328 million acres.

By 1919 many of the States had established some sort of forestry department, usually headed by a technically trained forester. Nearly all of them had legislation providing for control of forest fires, though the laws were not always effective. Several States had set aside State forests. The States have continued to expand and strengthen forestry work, and in 1948 it was reported that 38 States were administering 11.6 million acres as State forests.

In 1919, Henry S. Graves, the Forester, summed up the situation with

respect to forestry on private lands in his annual report, as follows:

"In the early years of the present century it really looked as though the management of forests as permanently productive properties might be voluntarily undertaken by private owners on a very large scale. Although many obstacles were presented by the internal conditions of the lumber industry, progressive lumbermen were giving much serious attention to the possibility of engaging in the practice of forestry. The chief stimulus was furnished by the rising value of stumpage. The panic of 1907 radically changed the situation. The lumber industry entered a period of protected depression. From that time on private forestry made relatively little progress in the United States, except on farm woodlands. While public forestry has made vast strides, the forests of the country that are in private hands are being depleted with very great rapidity, and almost everywhere without effort to renew them."

Graves concluded that "the general practice of forestry on privately owned lands in the United States will not take place through unstimulated private initiative." He proposed a broad forestry policy for the Nation, to include an expanded public program of land acquisition and a program for the protection and perpetuation of forest growth on all privately owned forest land that is not better for agriculture or settlement. He proposed that the Federal Government cooperate with and work through the States in promoting private forestry.

BETWEEN 1919 AND 1949, private forestry and public forestry expanded.

Graves' 1919 report marked the start of a campaign, which is still in progress, to develop a national policy for bringing about forestry on private lands.

W. B. Greeley, who became head of the Forest Service in 1920, took up the campaign where Graves left off. In 1920 the Capper Report on timber de-

pletion, lumber prices, and forest ownership, and the report of the forestry policy committee of the Society of American Foresters, headed by Pinchot, aroused widespread interest by showing the seriousness of the situation. As a result of these reports and the ensuing discussion, two bills were introduced in Congress. The Capper bill, which was revised once or twice, proposed direct Federal control of operations on private lands, through a taxation and bounty device. The Snell bill proposed Federal assistance to States in the exercise of their police power over private lands. Both bills included cooperation for protection against forest fires. The bills were debated widely and heatedly.

The result was the appointment of a Senate committee to consider these and other proposals for legislation and to hold hearings in various sections of the country. Meanwhile, the Forest Service undertook a series of "minimum-requirements" studies to develop a clearer analysis of what might be acceptable as reasonably good forestry practices in the various forest regions and types of forest. The Senate committee's deliberation led to enactment on June 7, 1924, of the Clarke-McNary Law.

This act extended the national forest acquisition policy to lands primarily useful for timber production rather than for watershed protection and broadened the fire-protection cooperation of the Weeks Law. Small appropriations were authorized for cooperation with States in growing forest planting stock for farmers and in advising farm-forest owners.

Enactment of the McSweeney-McNary Law in 1928 provided a broad charter for forestry research. It set up a 10-year program that included a system of forest and range experiment stations, expanded research in forest products, and a Nation-wide survey of forest resources and requirements. The Knutsen-Vandenberg Act of 1930 authorized a larger national forest planting program than had been possible

before. By 1947, more than 1.2 million acres had been successfully restocked.

The depressed and distressed condition of the lumber industry in the late 1920's led President Herbert Hoover in 1930 to appoint a Timber Conservation Board to study what might be done about it. One result was a temporary relaxation of efforts to sell Government timber. The study also led to the Copeland Report (A National Plan for American Forestry, S. Doc. 12, 73d Congress), an encyclopedic analysis of the forestry situation, published in 1933. The report laid greatest emphasis on acquisition of forest land by Federal, State, and local governments and increased assistance to private owners. A 20-year goal for acquisition was placed at 134 million acres for the Federal Government, and 90 million acres for State and local governments.

Good forestry practices were included in the lumber and other forest-industry codes under the National Industrial Recovery Act of 1934-35. Although this act was declared unconstitutional, work on the codes, particularly on the lumber code, was beneficial in giving the lumbermen a better understanding of what sustained-yield management means, of the advantages of selective logging, and of the nature of essential silvicultural measures.

Another depression-born activity that did much to dramatize forest conservation was the Civilian Conservation Corps. Set up as a major feature of Federal unemployment relief in 1933, almost half of the 2,600 camps operating at its peak in 1935 were engaged on forestry projects. In 9 years of existence, the Civilian Conservation Corps contributed some 730,000 man-years of work in forest protection, in construction and maintenance of improvements on public forests, in tree planting, and in timber-stand improvement. It greatly stimulated the establishment and expansion of public forests, particularly by States and communities in the East.

The Norris-Doxey Farm Forestry

Act of 1937 was aimed mainly at improving forestry practices on the many small farm woodlands. It authorized appropriations up to \$2,500,000 a year to provide advice, investigation, and plants for farmers, in cooperation with the States. In the fiscal year 1948 the Forest Service cooperated in 173 farm-forestry projects, located in some 650 counties in 40 States. Besides, about 65 forestry extension specialists worked in 45 States and 2 Territories.

In March 1938, President Franklin D. Roosevelt sent a special message to Congress recommending a study of the forest situation by a joint committee of both Houses, to form a basis for policy legislation relating to cooperation of the Federal Government and the States with private forest owners. He also proposed that the committee consider the need for regulatory controls and the extension of public ownership. The committee was appointed, held hearings at various places, and produced a report in 1941. Among other things, the report recommended Federal financial assistance to the States for regulation of forestry practices, but it did not suggest additional Federal acquisition of forest land.

The Forest Service undertook to make a new reappraisal of the situation in 1945 in order to bring up to date and amplify basic information on our timber resources, to interpret this information in relation to the national economy, and to reexamine national needs in forest conservation.

This study brought out that the crux of the forestry problem now is not the large tracts owned by industries but the small holdings of farmers and other tracts of similar size.

Many of the larger owners, particularly in the South and the Northwest, have been developing an interest in forestry for a considerable period. According to the Society of American Foresters, more than 2,500 trained foresters were employed by private industries in 1948, although there had been fewer than 400 in 1930 and only about 1,000 in 1940.

Meanwhile, several States, notably Oregon in the West, Maryland in the East, and Mississippi in the South, have enacted laws that provide for some form of regulation of cutting practices on private lands—mandatory in some States, optional in others.

Summing up the situation today, it can be said that although our forests as a whole are poorer in quantity and quality than they were 30 years ago, the stage is set for a reversal of the downward trend. The basic principles of forestry are better understood by more people than ever before. More and more timberland owners seem to be acquiring a sense of stewardship—a conviction that it is their duty to leave their land at least as productive as they found it. Furthermore, people are coming to realize that if our forests are destroyed we cannot expect the rest of the world to supply us with timber.

W. N. SPARHAWK is a native of New Hampshire and a graduate of Yale University. He joined the Forest Service in 1910. After almost 6 years on timber reconnaissance and in various research assignments in the western national forests, he was transferred to Washington, where his first assignment was a Nation-wide study of fire hazard and protection. As a forest economist, he participated in the preparation of numerous reports and bulletins that dealt with economic problems in forestry. He is joint author with Raphael Zon of the two-volume work on Forest Resources of the World, 1923. During the Second World War he was consultant to military agencies on foreign forestry. Mr. Sparhawk is a fellow of the American Association for the Advancement of Science and the Society of American Foresters, and a member of the Washington Academy of Sciences. He is editor of the forestry section of Biological Abstracts, and was associate editor of the Journal of Forestry from 1936 to 1948. Mr. Sparhawk retired from the Forest Service in 1948 and is now living in New Hampshire.