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The U.S. Forest Service, a History

First Revision
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Fernow years 1886-189

CHAPTER II.

THE WATERSHED OF THE NINETIES

The decade of the 1860s was a turning point for American land policy -- a vital era of land grants to transcontinental railroads and institutions of higher learning, free homesteads for the farmer, and creation of the Department of Agriculture. So too was the decade of the nineties.

Americans had become interested in reform and were questioning institutions that they had always accepted. Prior to the nineties, America was predominantly rural but the nation was now turning industrial and urban, with concurrent changes in population, technology, and economy.[1/] The decade, misremembered as the Gay Nineties, actually saw the Sherman Anti-trust Act, debates on free silver, labor riots, Coxey's Army, and the Spanish American War, which marked the apex of American imperialism. What little gaiety there was seems to be accounted for in the three months of the 1893 Columbian Exposition in Chicago. Even there came a solemn note from a young professor earnestly offering an explanation for much of what was happening.

Chicago was hot that July 12, 1893, but by evening the breeze off Lake Michigan lowered temperatures to a more tolerable level. Professor Frederick Jackson Turner of Wisconsin, age 31, faced his learned audience of historians and read the paper he had been working on right up to his time on the program, "The Significance of the Frontier in American History." Turner elaborated on the thesis implied in his title, that America's democratic institutions owed much of their identity to the western frontier. This provocative notion "opened a controversy that was large enough to command the attention of his peers for four generations."[2/]

Turner referred to the 1890 census, which had celebrated the centennial of American census-taking by proclaiming, perhaps prematurely, that Western settlement at last was dense enough to eliminate officially a continuous north-south line demarking the frontier. After explaining how key American traits were related to the existence of a frontier, Turner predicted major changes in the national thought. The ending of the frontier meant a lessening of cheap resources; Americans would have to learn to adjust their economic, political, and daily lives to a new kind of world.[3/] Oklahomans dashing into the Cherokee Strip, only months later, offered prompt support for Turner's prediction.

rephrased Elsewhere on the exhibit grounds, the lumber and forestry building housed exhibits designed to appeal to a much broader audience than the one which had listened to Frederick Jackson Turner. A mighty colonnade of tree trunks, one from each state, symbolized the federal structure of American government. As chief of the Division of Forestry, U.S. Department of Agriculture, Bernhard E. Fernow chatted with visitors about the theme on display -- developing and teaching forestry as a science.[4/]

At this Chicago exposition celebrating the five-hundredth anniversary of Columbus' discovery of North America, both Turner and Fernow looked at conditions they believed to be uniquely American. At least from certain vantage points, both were correct.

THIRD CHIEF -- FIRST PROFESSIONAL

Bernhard Eduard Fernow had replaced Nathaniel Egleston as chief of the Division of Forestry on March 15, 1886. On July 1, Congress gave full statutory recognition to the division; no longer would it exist at the whim of a commissioner

of agriculture. Although Congress provided stability, it was still parsimonious. The State of New York, recognizing the efforts of Hough and others, had appropriated $15,000 for forestry that year, but funds for Fernow's federal agency totaled only $10,000. Responsibility for forested regions of the public domain still lay with the Department of the Interior.

Fernow had attended the American Forestry Association meeting held in Philadelphia during the national centennial celebration. Holder of a German forestry license since 1869, Fernow stayed on in the United States after marrying his American sweetheart. He worked as a forestry consultant to a Pennsylvania firm. Proceedings of the American Forestry Association show his increasing importance in forestry affairs; there is much evidence that he associated with both Hough and Egleston for these annual sessions. Fernow's abilities did not go unnoticed, and Abram A. Hewitt, prominent leader of Democratic politics, recommended him to President Grover Cleveland as Egleston's successor, even though it was well known that Fernow was a Republican. As far as Fernow was concerned, Egleston bore him no ill will but instead was relieved to be free of the responsibilities. "We have been and continue to be on the best of terms."[5/]

While Fernow was getting settled at the Department of Agriculture, public forest lands seemed under siege. General Land Office Commissioner William Sparks had denounced timber frauds in northern California. A lumber company had openly used farmers, sailors -- any available person -- to file under the notorious Timber and Stone Act. These benign conspirators would sell their claims to the company for a modest sum and go about their business. A year before, Sparks in desperation had suspended all entries in order to gain control of the situation. One of his agents reported that the going rate for dummy entrymen ranged from $50 to $125, and you could buy a witness for $25. The same agent estimated that

three quarters of the claims filed with him were fraudulent; a more optimistic colleague guessed that 50 percent was a better figure.[6/]

As Land Office staff watched reports of fraud and depredation pour in seemingly without end, a pattern emerged. When the price of timber increased, so did timber fraud. Unfortunately for the bogus entrymen, the price of timber frequently dropped before they could clear the claim. One can imagine grumbling about so much government red tape that an honest man couldn't make a living. Agents for Interior's Division P investigated thousands of fraud and trespass cases every year but were unable to stem the tide. As John Ise has put it, fraud was a frontier way of life.[7/]

Despite widespread complacency about timberland problems, efforts for corrective legislation did continue. One of Fernow's first assignments was to draft an enforcement bill for Senator Eugene Hale of Maine. As was frequently the case, Fernow acted in his capacity as an officer of the American Forestry Association, not as chief of the Division of Forestry. The bill elicited opposition instead of support. Kansas Senator Preston B. Plumb, usually a friend of forest protection, objected to having the bill referred to the Committee on Agriculture and Forestry. After all, the bill did provide for creation of a commissioner of forests in Interior. Fernow probably felt little concern about which committee heard the bill. He saw the difficulties involved in getting control of the forests away from the General Land Office and assessed the administrative capability of his department as inadequate for the management task; at the time, Agriculture lacked cabinet rank.[8/]

The Hale bill died in committee, but it did provide a blueprint for later legislation. Hale had proposed to suspend entry on all federal forest land

until it could be examined and classified. The secretary of the interior could recommend to the president which lands should be reserved. The commissioner of the General Land Office would appoint rangers and make regulations for logging, grazing, and other uses on the reservations.[9/]

Whatever other defects members of Congress may have seen in the Hale bill, it was too ambitious for the times. To propose both forest reserves and the means to administer them was unrealistic. Progress would have to travel a much longer and indirect route. There had been repeated attempts to deal with public forest lands, but never adequate congressional support.[10/] The Department of the Interior was limited to policing trespass and investigating fraudulent entries under a myriad of laws. Then, as with the 1876 seed-distribution rider that authorized a forestry agent in the Department of Agriculture, Congress almost accidentally made a major advance toward protecting forest lands.

CREATION OF FOREST RESERVES

Much of the original documentation has been lost for what is now called the Forest Reserve Act of 1891. It is unfortunate that one of the most important legislative actions in the history of conservation is so obscure. Section 24 of this law authorized the president to reserve certain forest lands from the public domain.[11/] The reservation clause had a lengthy list of precedents but in the main the idea began two years earlier. In April 1889, the law committee of the American Forestry Association, Fernow, Egleston, and Edward A. Bowers of the General Land Office, met with President Benjamin Harrison. Egleston as spokesman presented a petition advocating adoption of an efficient forest policy. The president was cordial but took no noticeable action. The following year, after Fernow's prompting, the American Forestry Association memorialized Congress

to make reservations and to provide a commission to administer them.[12]

The same American Forestry Association law committee made an appointment to see Secretary of the Interior John W. Noble. Fernow, Bowers, and Egleston were joined by John Wesley Powell of the Geological Survey and others. Years later, Fernow remembered Powell dominating the meeting, trying to convince Noble "that the best thing to do for the Rocky Mountain forests was to burn them down." Fernow used the brief time remaining to impress the secretary of his responsibilities to protect the public domain. Accounts vary as to who said what. It is generally accepted that as a result of the meeting, Noble personally intervened with a congressional conference committee at the eleventh hour to get Section 24 added.[13]

(Sentence "One scholar, however, casts doubt upon Noble's specific role, and Fern was deleted here on request of Henry Clepper). Placed in footnote.

That this presidential authorization to create forest reserves was added in a House/Senate conference committee and not referred back to the originating committees for their consideration has been noted by several authors. Historians have given much attention to this deviation from standard procedure. That Section 24 became law of the land improperly has also been well emphasized, as well as the fact that Congress passed this most important bill without being aware of its content. These views distort the legislative history of the law of 1891, so important to the history of the Forest Service.[14]

The main purpose of the bill was to reform a series of land laws. Debates in Congress on this subject had been common during the 1880s. Mark Dunnell, who had returned to Congress in 1888 after a 3-term absence, opposed attaching forest reserve legislation to general land reform, as he believed that forestry was important enough to warrant its own measure. Too, he was upset that the Timber-Culture Act of 1873, which he had originally introduced in the House, was

one of the laws scheduled for repeal. It is not clear from the record, but apparently Dunnell remained forestry's champion, even though he opposed addition of Section 24 as a rider. Others on the Public Lands Committee overrode Dunnell's objections and the clause stayed.[15] In retrospect, Dunnell's tactics at least made sure that his congressional colleagues were aware of -- even familiar with -- the substance of Section 24. However, it is unlikely that few if any could imagine the impact of what was to follow.

President Harrison wasted no time in exercising his new powers. He first set aside the Yellowstone Forest Reserve. By the end of 1892, mostly to protect water supplies, he had created fifteen reserves containing over thirteen million acres. His successor, President Cleveland, added five million acres more -- then stopped. Until Congress provided the means to protect the forest reserves, Cleveland said that he would set aside no more. After all, without protection, the reserves fared no better than unreserved lands in the public domain.

Protective legislation for the reserves was promptly advocated. In his 1891 report, General Land Office Commissioner Thomas H. Carter pointed out the need for managing the new reserves, as did the American Forestry Association and others. Secretary Noble "urgently recommended that Congress take proper action to have the reservations... established as national parks:" or to be granted to the states for public use. The American Forestry Association, having made detailed recommendations for areas to be reserved, asked for "a wise and just system" that would be scrupulously and rigorously enforced. The conservationists feared that the administrative procedure of requiring cutting permits from the Land Office would do little to protect the reserves. Fernow read to the forestry association

a paper entitled, "The Proper Administration of Forest Reserves."[16]

When Grover Cleveland returned to the White House in 1893 after a 4-year absence, he named Hoke Smith as his secretary of the interior, bringing a mind more imaginative than Noble's to that office. Smith had actively sought the appointment, and Cleveland, with some misgivings, consented. The president believed that Smith would take a hard line against raiders of the public domain. Although Noble had been influential in getting the reserves established, he had viewed them as simply augmenting the national park system. Smith, however, immediately recommended legislation to provide a comprehensive forestry system and creation of a forestry commission to advise the commissioner of the General Land Office.[17]

Support (swelled) both within and without government for legislation to deal specifically with administration of the forest reserves. Within two weeks of the 1891 law's passage, Fernow was advising that his agency would cooperate with the American Forestry Association on implementation. He saw need for data on proposed reserves and new regulations for the Department of the Interior to regulate timber cutting. In his annual report, Fernow explained that more national parks were not the intent of this law; the goals were protection of public property and production of revenue. He reminded his readers that the Division of Forestry had no jurisdiction over public forests, the General Land Office administered what regulations there were. Fernow also supported Cleveland's nomination of J. Sterling Morton to be secretary of agriculture. (Traditionally,) secretaries became president of the American Forestry Association, and Morton was no exception. He had acknowledged (before) his senatorial confirmation that as secretary he could do much to advance the interests of forestry.[18]

Senator Algernon S. Paddock, chairman of the Committee on Agriculture and Forestry, introduced a bill "For the Protection and Administration of the Public Forest Reservations" in March 1892. Expanded in committee the bill was reintroduced to provide for withdrawal of all public timberlands and to place them under military protection, also to return agricultural land to the public domain for disposal under existing legislation. Paddock's bill provided for administration of the reserves to be under the Department of Agriculture. Fernow enthusiastically favored the bill, even though he correctly surmised that it asked for too much. He would settle for less.[19/]

Concurrently with the Paddock proposal, Congress was considering HR 119, the sort of bill Fernow believed to be more realistic. Congressman Thomas R. McRae, chairman of the House Committee on Public Lands and a member of the American Forestry Association, introduced his bill "To Protect Forest Reservations" in 1893. Later he would give Fernow credit for convincing him that forestry meant use of forests, not reservation from use. McRae's bill strongly resembled the Hale bill of 1888, drafted by Fernow, which provided for sale of timber to the highest bidder. (In McRae's version,) the Department of the Interior would administer the reserves.[20/]

Secretary Smith, Fernow, and the American Forestry Association, supported McRae. Opposition came from the West, both (to) opening the reserves to logging, thus jeopardizing water supplies, and (to) impeding the miner and stockman. There was strong sentiment for providing free timber to settlers; sales would be a dangerous precedent. McRae revised his proposal so settlers could get free timber. He brought it back to the floor of the House, this time with a favorable Public Land Committee report. A motion passed 117 to 54, but lacking a quorum

this effort failed, too. McRae's third version ended western opposition by allowing mining on the reserves. The 159 to 53 vote in fact reflected strong western support.[21]

When HR 119 was referred to the Senate, Henry M. Teller of Colorado, who had been secretary of the interior, 1882-1885, substituted his own version. Teller wanted to limit the standards for reserve creation to water protection only; he believed that timber supply was not a proper justification. He moved his proposal quietly through the Senate, but both his and McRae's died in conference.[22] Although Congress would eventually adopt the main feature of McRae's proposal, it would happen by less straightforward means.

WASHINGTON BIRTHDAY RESERVES

As early as 1889, the American Forestry Association had advocated a special commission to study public timberlands and recommend how they should be treated. In fact, John Muir and Carl Schurz had proposed such a commission in the 1870s, but this earlier recommendation went unheeded. Support for the idea increased as the reserves remained unprotected. Fernow could see no reason for further study. It was readily apparent that the reserves needed protection. Why waste time with a study? Instead, all energy should be aimed at getting legislation. But within the American Forestry Association developed strong backing for a commission.[23]

In June 1895, Wolcott Gibbs, Charles S. Sargent, and Gifford Pinchot met at Sargent's home in Boston. Pinchot was a young forester with boundless enthusiasm, Sargent an eminent botanist, and Gibbs president of the National Academy of Sciences. The trio decided to use the organization to bypass Congress, which was reluctant to establish a forestry commission. At a meeting of the

American Forestry Association that fall, the idea of a commission gained support over Fernow's protests that further study was unnecessary. The time was ripe for action. Fernow insisted a commission would be a backward step. However, Pinchot and journalist Robert U. Johnson succeeded in carrying the meeting and won a resolution favoring a forestry commission. Fernow fought back. At the next meeting of the association's executive committee he managed a statement branding such action as "prejudicial to the passage of the definite legislation now before Congress."[24/]

Needed was a letter signed by Secretary Hoke Smith requesting the National Academy of Sciences to appoint a forestry commission. In November 1895, Pinchot noted in his diary that he had drafted such a letter. However, another draft, dated December 1895 and unquestionably in Fernow's handwriting, contains precise phraseology used in the letter signed the following February by Smith. It lends strong support to Fernow's later contention that he, through the American Forestry Association, was instrumental in creating the commission. Pinchot, too, takes full credit. In any case, the important fact is that Smith signed a formal request to the National Academy of Sciences on February 15, 1896.[25/]

The letter asked the academy to study the forests on the public domain and report back in time to send the information to Congress during the current session. The commission was to determine whether fire protection and permanent forests were practical on the public domain, estimate the influence of forests on climate, soil, and water, and recommend specific legislation. Gibbs explained that the assignment was the largest the academy had ever received from the government; the report would be impossible to complete

before Congress adjourned. Gibbs named to the commission Alexander Agassiz of Harvard, Army engineer Henry L. Abbott, William H. Brewer of Yale, geologist Arnold Hague, and Pinchot, the only one who was not a member of the academy. Armed with a $25,000 appropriation, the commission headed west to study the forest reserves.[26/]

Sargent was awed by his commission's assignment. The reserves already included 20 million acres, and he suspected that local residents would be uncooperative. He admitted to having "more on my hands than I can manage" but immodestly pointed out that there was no one else with his knowledge to head the project. He glumly predicted that Congress would ignore the final report, anyway. Pinchot did not share Sargent's view, noting that the chairman was "utterly without plan or capacity to decide on plans submitted." As committee work progressed, Pinchot's disenchantment grew.[27/]

Fernow's biographer justifies leaving the chief of the Division of Forestry off the commission, as it would have meant Fernow might sway the report to validate his own policies.[28/] However, as the commission was to study the reserves in Interior and Fernow worked in Agriculture, his exclusion seems unjustified. Fernow, himself, was bitter.

A frequent respondent, Abbott Kinney, wrote to Fernow, reporting on the commission's brief inspection of the forest reserves in southern California. Why wasn't Fernow a member? The Californian regretted also that the group had been unable to see examples of major flood damage in a reservoir. With sarcasm, Fernow explained that the committeemen had "imagination enough to describe the conditions from reports of others sufficiently well for the

sake of argument to secure legislation." Fernow then told Kinney that he had been instrumental in the commission's creation, having written the letter for Hoke Smith's signature. He pointed out that this information was an "inside history" of the executive committee of the American Forestry Association. "Nevertheless, I have been neither consulted nor in any way asked to contribute my share, nor recognized in my existence as the representative of the Government on this question." But, he philosophized, "Such is life, and such are people." What counted to Fernow were the ultimate results. He expected that the recommendations would not vary much from the programs advanced by the American Forestry Association over the years.[29]

But they did. Fernow and the American Forestry Association had accepted the political realities of western opposition to forest reserves. Therefore, they supported a slow, gradual reservation program to avoid triggering strong protests. The commission, however, had full support from the new secretary of the interior, David R. Francis, who endorsed their recommendation for immediate creation of thirteen forest reserves covering 21 million acres. Gibbs' letter of transmittal to President Grover Cleveland suggested that Washington's birthday on February 22, 1897 would be an appropriate date for the proclamations. President Cleveland obliged and set off the furor Fernow had feared.[30]

(Sentence deleted)

Furor indeed. Five days later, Fernow wrote NAS commissioner Arnold Hague that he was not surprised by the "howl" raised over the president's action, and he predicted more. As to the thirteen reserves, Fernow added, "I want to claim a good share of the credit in this for the Forestry Association as having paved the way towards making it possible to secure not only reservations

but the committee itself.[31]

The howl Fernow described grew louder. Typical of western outrage was a Seattle Chamber of Commerce memorial to Congress. The northwesterners fumed that they were being treated as a "mere dependency" and their further economic development was being prohibited by the "gratuitous suggestions of three irresponsible strangers [NAS committee], after a flying visit of a couple of days . . . ." The whole episode was a "galling insult to [our] local sovereignty." Pulling out all stops, the chamber raged that "...King George had never attempted so high-handed an invasion upon the rights..." of Americans.[32]

Scarcely a week after Cleveland's precipitous act, Fernow told a colleague that the situation "has changed most unexpectedly and most seriously." To another he lamented, "Alas! Our forward steps have frequently to be taken back . . . ." He described Cleveland's act as "injudicious" as it made no provision for managing the reserves. The proclamation had "stirred up such an antagonism as we have never had before."[33]

SUNDRY CIVIL BILL

Buried under an avalanche of protests, congressmen moved to appease constituents. An amendment to the Sundry Civil Bill restoring the entire area to the public domain passed the Senate. Fernow labored behind the scenes and got the House conference committee to insert an amendment giving the secretary of the interior authority to establish a division to protect and manage the forest reserves. Management included the right to sell timber, something he had tried for years to achieve. His effort only partly succeeded; President Cleveland refused to sign the bill because of other defects.[34]

Secretary of the Interior Francis left us with his recollections of Cleveland's refusal. The appropriations measure cleared Congress and arrived at the White House on the day of McKinley's inauguration. The outgoing president asked each member of the cabinet to comment. Francis was second to last, being senior only to Secretary of Agriculture Morton. When his turn came Francis pointed out that the measure revoked the proclamation that had created the 21 million acres of reserves. At that moment a messenger interrupted to announce that McKinley had arrived. Cleveland hesitated, then threw the Sundry Civil Appropriations measure on the floor saying, "I'll be damned if I sign the bill."[35/]

Cleveland's pocket veto of the appropriations measure left the government without funds for the new fiscal year. McKinley quickly called Congress into extra session on March 15. Forces concerned about forest reserves rallied. The opposition made full use of its momentum, but the defection of Senator Richard Pettigrew of South Dakota eventually turned the tide in favor of the reserves. This powerful member of the Senate public lands committee had been a staunch foe of Cleveland's "Washington Birthday" reserves, but Charles D. Walcott, director of the U. S. Geological Survey, won him over.[36/] Walcott persuaded Pettigrew to sponsor an amendment to the new Sundry Civil Appropriations bill. Walcott drafted the amendment modelling it after McRae's much-battered HR 119. The amendment specified the criteria for reserve designation--water protection and timber production--and excluded mineral and agricultural land. Also, settlers could have free timber and stone.

Then Walcott convinced Pettigrew to add another clause, suspending

the new reserves for nine months. The suspension clause was a clever tactic to overcome western demands for total elimination. Under this clause, those who had entered the designated reserves could transfer their claim, within nine months, to other parts of the public domain.[37] They could select new tracts in lieu of the original claim--the so-called lieu-selection process.

Walcott met with NAS committee members and others to plan strategy. After convincing McKinley's newly appointed secretary of the interior, Cornelius Bliss, they approached the president. McKinley, not wanting to alienate any congressmen this early in his administration and facing much greater and more important demands to go to war with Spain, was cordial and strongly supportive of the forest reserves. It would have been easier for him to rescind Cleveland's besieged proclamations, but McKinley agreed to let them stand, although he could not offer open support.[38]

The Pettigrew amendment to the Sundry Civil Appropriations bill won handily in the Senate, with strong western backing. That the measure was favored by opponents of conservation probably resulted from western concern over unmanaged, locked-up reserves. (Assurance) that the reserves would be open for use (eliminated) the main reason for opposition. Ironically, McRae, whose HR 119 had been the pattern for the Pettigrew amendment, fought acceptance in the House. He believed that opening the reserves would jeopardize their flood control (capacity.) The House adopted the measure, and a conference committee ironed out differences. The only important conference change was a modest reduction in the lieu-selection generosity. With congressional approval, President McKinley signed the bill on June 4, 1897.[39] Thus the third major piece of forestry legislation moved through Congress as an amendment, never

having had to surmount the full legislative process.

The victory belonged to many. Fernow certainly deserves major credit. The American Forestry Association provided its good offices, bringing together foresters, legislators, and others concerned about the reserves. Sargent, Pinchot, and the National Academy of Sciences' commission were able to bring presidential intervention into a congressional stalemate. Several members of Congress--McRae, Pettigrew, Paddock--made contributions of their own. The achievement itself may be judged on its own merits.

What some historians call the Pettigrew Amendment turned out to be the basis of federal forest reserve management for sixty-three years until revised in 1960. The law authorized the U. S. Geological Survey to examine the forest reserves. It stipulated that no reserve could be established "except to improve and protect the forest within the reservation, or for the purpose of securing favorable conditions of water flows, and to furnish a continuous supply of timber for the use and necessities of citizens of the United States; ..." Further, the secretary of the interior was directed to make rules and regulations for the protection of the reserves. Perhaps most significant, in terms of what Fernow, Pinchot, and others had sought, sale of timber was also authorized. Timber selected for sale had to be appraised, advertised, sold at or above appraised value, "marked and designated" prior to cutting, and supervised during cutting. Within three weeks, field agents of the General Land Office had been instructed how to proceed under the new law.[40/]

1st sale 1898-99-
Homestake Mining Co.
Deadwood, S. Dak.

Two of the most important legislative events in the history of the Forest Service took place during the decade of the nineties, the laws of 1891 and 1897. The nation now had forest reserves and the means to protect and

manage them. More adjustments would take place, but the basic elements of federal forestry now were intact. Dwelling on these two laws, however, leaves an unbalanced view of Forest Service history. Obviously, most of the agency's energies have been devoted to non-legislative tasks.

FERNOW AS SCIENTIST AND ADMINISTRATOR

When Fernow had taken over as chief of the Division of Forestry from Egleston in the spring of 1886, the agency still lacked permanency. The commissioner of agriculture could on his own decide to discontinue the meager effort. On June 30, however, Congress gave the division full statutory status. But status was not full recognition of importance. As we have seen New York State had appropriated $15,000 for its 1886 forestry efforts, but Congress set aside only $10,000 for Fernow's use. Inadequate financial resources were apparently not the issue, as Congress was concurrently wrestling with huge budgetary surpluses--to congressional minds, $10,000 was obviously enough for forestry matters.

Fernow had been hesitant to accept the federal appointment, writing a colleague that he had accepted the position "after all." The position seemed political, rather than technical and he feared that he would be out of his element. For ten years he had worked at a variety of consulting jobs. Now he was looking for "useful" things to do, but first he had to file a report in a few months. Fernow offered to pay his associate's expenses for gathering information on federal timberlands in Colorado. Fernow wanted a map, too.[41/]

Fernow furiously scrounged forestry literature for information. Writing to V. M. Spalding that he had been in office only three days, Fernow

explained that he wanted to place the division on a "more scientific and systematic basis," but priorities dictated a report by July 1. He hinted that perhaps Spalding's work on white pine could be far enough along for inclusion. To another correspondent, Fernow outlined his hopes that the division would bring into closer connection all agricultural schools, forestry associations, and horticultural societies. He closed with a plea for data on federal forest lands in Minnesota; he could pay travel expenses.[42/]

Fernow's hurried efforts produced a sound statement of forestry principles. He made the usual references to the influence of forests on streamflow and climate and noted the exhaustibility of supply. Eastern forests, he predicted, would be depleted in fifty years and even the stupendous western forests would ultimately share the same fate.[43/] Fernow's most important contribution, one that introduced modern professional forestry concepts, dealt with economics.

To Fernow, the basic deficiency in handling forest resources was the failure to distinguish between interest and capital. Sustained yield, after all, was based upon the notion of harvesting annual or periodic growth increments--the interest. Overcutting occurred when the resource base [capital] was depleted to a point where the desired growth could not be maintained. Cutting into forest capital reserves would in the long run lead to exhaustion.[44/]

Fernow perceived overcutting as unnecessary as well as undesirable. Oversupply of lumber was the problem; solve it and the threat of exhaustion would disappear while the lumbermen's profits would increase. Utopia? Not at all. Railroad land grants had made available vast amounts of low-cost timberland

for speculative purchases. The flood of low-cost timber yielded low-cost lumber, forcing prices lower and lower. Lower prices meant that the lumberman had to sell--therefore produce--more lumber to meet fixed costs, worsening even further an already glutted market. Fernow believed that the lumber industry was unique in that the laws of supply and demand worked only to its detriment. The industry was unable to cope with a fluctuating market price and needed "the fostering care of a far-seeing governmental policy."[45/]

Fernow offered no specifics, given the American tradition of property rights, but he did propose that government timber be withheld as a means to alleviate oversupply. He hoped that examples of good forestry on federal reserves would be adequate to start the industry on the right track, obviating a potential need for government force.[46/] Although over-simplified in many respects, the report was an amazing effort for the thirty-five year old chief who had spent only four months on the job.

That out of the way, Fernow wrote to the commissioner of agriculture proposing changes in the division's organization, now that it had statutory permanence. He listed Egleston and Best as his assistants and eight clerks shown on the division roster. Complaining that six of the clerks were not under his jurisdiction, one was sick, and the eighth only worked part-time, Fernow asked that all of the clerks be taken off his payroll. He apologized to his superior for grumbling about clerical inefficiency in the staff he had inherited, but none knew botany or forestry, had command of a foreign language, were skilled in research technique, or could operate a typewriter. He also asked that either Best or Egleston be removed; he didn't care which.[47/]

Fernow's requests were modest, indeed. If only he could have "a small plot of ground;" perhaps the Bureau of Animal Husbandry could spare some space at its station. For a clerk, he wanted a recent college graduate botanist, who could be "a young lady with knowledge of typewriting." This botanist clerk would be paid $900 per year. His total budget was $8,000; $3,500 for the division headquarters and $4,500 to support special agents studying western forests.[48/]

Fernow divided the work of the division into four categories: general and statistical, economic, forest botany, and forestry proper. Under general and statistical he included studies of the forests of Colorado and California by Edgar T. Ensign and Abbot Kinney, as well as reviewing scientific arguments on the effects of forests on climate. Economic studies would focus on the wood-using industries--charcoal, iron, mining, lumber, and railroads--"especially those directly controlling forest property." Fernow listed thirteen timber types or species as deserving investigation under biological studies; commercial value was obviously of prime importance. Finally, he proposed to publish manuals on tree seed, nurseries, and thinning, which he thought would be "exceedingly valuable" for educational purposes. All totalled, an ambitious program for a division with an $8,000 budget and recently swept clean of most of its staff.[49/] His own house in order, Fernow looked at the broader problems of American forestry.

In 1886, the same year Fernow became chief of the Division of Forestry in the Department of Agriculture, Edward A. Bowers joined the Department of the Interior as an inspector of public lands. The two were well-acquainted, having been leaders in the American Forestry Association. Bowers asked Fernow to propose policies for government-owned forest lands.

(Sentence deleted)

To Fernow, the forest was a valuable national property exposed to "reckless and shameful deterioration and depredation." Opposition to reform could stem only from ignorance or by "people not wholly disinterested in the thieveries upon the public domain." To him the issue was simple: "How shall we preserve for legitimate and economic use" the remnants of the public domain? Sustained yield was Fernow's answer to Bowers.

He calculated that federally owned timber was worth conservatively 280 million dollars. At 5 percent, annual income from public forests would be at least 14 million dollars. Certainly as a straight business investment the government could well afford to set up an effective management program--a program Fernow modelled after his earlier Prussian experience. First, he suggested, withdraw all forest land from sale. Land found suitable for agriculture could be restored later. Second, create an enforcement bureau in the Department of the Interior, probably in the General Land Office. The bureau would have a central headquarters with district offices convenient to forested areas. Each district office would use inspectors to assure compliance with policy by rangers, Fernow's title for those responsible for the smallest administrative units. Policy would emanate from the central office; staff would be required to make field inspections at least once annually. Under his plan, timber prices and sales would be based on local conditions and local demand and should receive "primary consideration."[50/]

Fernow made little headway reforming either Interior or inspiring his own Department of Agriculture. He sadly came to the conclusion "that under present conditions no practical work will be done and we might as well satisfy ourselves, that all we can do is talk." Perhaps it was just as well, for he needed much specific information about American forests "before we can

even judiciously suggest" a correct management system.[51]

new insert

Fernow saw need to advance forestry on more than the governmental front. At the opening ceremonies of the Pennsylvania Forestry Association in 1886, he had suggested what those interested in promoting forestry ought to do while waiting for the national movement to coalesce into strong, federal programs. To ask a lumberman to cut fewer trees would be "in vain," as he was absorbed in supplying a sawmill. The most productive target, according to Fernow, would be the farmer who owned a small woodlot. Fernow told his audience that the individual farmer would show little concern for forest destruction in general; the message would have to deal with his own property. Forestry manuals would not suffice; a farmer might read a brief, clearly written article but not a manual. The most fruitful method would be for a "competent plain spoken man" to address the farmer face to face. Fernow encouraged the association to raise funds in order to support "travelling teachers." He predicted that the teachers would build support for remedial forestry legislation, needed in Pennsylvania and many other states.[52]

Despite some frustrations, Fernow sat at his desk with a sense of achievement. He had been able to reorganize his staff satisfactorily. By his second year, he had hired two field agents, and Egleston was helping in the office. Each earned $1,500 per year. Fernow was especially pleased with his new assistant, George Sudworth, and he recommended giving him a 20 percent increase in salary. (Phrase deleted) Fernow's peace of mind had markedly improved over the previous year.[53]

phrase inserted

Obviously gaining confidence after being on the job for several

years, Fernow told Assistant Secretary of Agriculture Edwin Willets that the Division of Forestry should have executive responsibilities, that is, it should be managing forests owned or controlled by the federal government. His office was mainly educational, since without forests it could act only as a "bureau of information and advice." Fernow could not know that two years later the first forest reserves would be established, or he might have pressed with more vigor the justification for his agency to manage forests. Instead, he seemingly resigned himself to his educational fate and delineated for his superior how he gathered forestry information and which groups used it.[54/]

(Paragraph on Powell deleted here)

Fernow could be caustic when his agency or its work received less than praise. One critic's name was "burnt into my record of knownothings" for "slandering" certain research projects. Fernow acted in a similar vein when he clashed with Henry Gannett of the Geological Survey over the need for a stronger federal forest policy. In an April 1, 1893 article carried by a Washington, D.C. newspaper, Gannett claimed that the relation between forests and climate, soil, and water was little proven. He added that forests, although diminished from the original amount, were growing faster than they were being cut. To him the "'laissez faire' policy seems to be the best." Public interest in forestry should be limited to improving transportation systems to aid forest commerce.[55/]

Fernow was aboard the steamship Aller, bound for Germany to assist his mother country in planning its exhibit for the 1893 Chicago exposition. A shipboard friend showed him Gannett's article; another wrote describing it as "stupid." Fernow agreed and counter-attacked publicly in his annual report. He acknowledged that the relation of forests to climate had been exaggerated

and much more information was needed on relations with soil and water. But then, branding Gannet's presentation as a dangerous collection of half-truths, Fernow charged that "any observant logger" could quickly spot the inaccuracies. He was discouraged that a man in a high position like Gannett would ignore his responsibility for careful reporting and dismissed the geographer's preference for "laissez faire" government as unwarranted.[56/]

Charles Sargent had made an impressive contribution to forestry in the 1880 census, showing the potential of the national inventory at the beginning of each decade. Fernow was disappointed when Gannett failed to utilize fully the resources of the 1890 census in gathering forestry statistics, as had Sargent ten years earlier. Their spat continued when Gannett's Division of Geography and Forestry acquired functions overlapping those of Fernow's agency. Resolution of differences between the two departments occurred after Fernow resigned his post; his successor was a great fan of Gannett.[57/]

Not all of Fernow's problems were external. His Prussian temperament and scientific training made it difficult for him to accept the indignities of being a minor bureaucrat in a department that had not achieved cabinet status until 1889.

Fernow had welcomed Secretary of Agriculture J. Sterling Morton to office, but he had second thoughts. In January 1894 Morton sent a memo to all of his division chiefs, instructing them to keep a daily time record for all employees and submit it to the chief clerk. Absences, the secretary ordered, were to be charged to annual leave. He added that "fabrication" would result in dismissal. Instead of assigning a clerk to this task and going about his work, Fernow elected to be offended. He expressed

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his "great regret" to Morton that he evidently intended "to reduce the chiefs of divisions to the levels of clerks and time servers." Fernow protested that division chiefs were finally achieving a degree of respect, and he resented the "insinuation" that he was not giving all the time and energy he could spare to his work. Fernow believed the secretary's suggestion that a chief might falsify his reports was "so degrading that no self-respecting man will allow it to go without protest..."[58/]

As intemperate as this response might seem, it represented an effort at self-control on Fernow's part. His first reaction to Morton's order had been to demand that Morton "consider at once my resignation... as I do not desire to hold a position as clerk subject to the dictation of any indiscreet underling that may from time to time be invested with such unheard of authority."[59/] (He had second thoughts and sent a milder version.)

Fernow continued to protest what he believed to be a reduction in status. An exasperated Morton asked the attorney general to rule on the relation between the chief clerk of the department and the chiefs of divisions. Hoping to settle the matter, the secretary told Fernow that he had confidence in the chief forester's ability to "accommodate himself to the attorney general's interpretation cheerfully and manfully." But Fernow was not satisfied with the interpretation and pleaded with Morton to make a final ruling. Fernow acknowledged Morton's authority to subordinate an officer to a clerk but could not believe that he really intended to do so. Fernow wrote the secretary that surely he did not mean to "degrade" him and "thereby compel the retirement" of Fernow and other division chiefs. Morton, showing great

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patience, responded that the attorney general's interpretation had clearly specified the relations between the chief clerk and division chiefs. He asked Fernow to specify ambiguities in the interpretation, but the forester let the matter rest.[60/] (Long ff elaborating this dispute is deleted to

Despite his petty disputes over recognition and status, Fernow carried on an admirable technical program. As we have seen, he began his term as chief of the Division of Forestry by inviting men already engaged in forestry studies to participate in the federal program. In addition to the work accomplished by these field agents, Fernow and his staff produced many worthwhile contributions. To use his own terms, during Fernow's twelve-year administration, the Division of Forestry published approximately six thousand pages of technical material for a total appropriation of $230,000. This figured out at about 24 dollars per page; not a bad price considering the values involved, calculated Fernow.[61/]

Publications of the division covered a range of topics, reflecting Fernow's particular interests and the important uses of wood during that period. The drain on forests by railroads was the subject of several monographs, timber physics--the mechanical properties of wood, a favorite of Fernow--occupied many pages of the six thousand total. (Fernow's 1893 study on the relation of forests to climate and water supply, a valuable contribution to the subject, included a history of rainmaking lore and experimentation. He had no wish to get involved with weather modification, but Congress insisted. Fernow felt silly; it seemed a favored rainmaking prescription was to shake water loose from clouds with cannon fire. He managed to involve the Army Signal Corps and returned to research he deemed more suitable.[62/])

new insertion

There were other important contributors to scientific forestry literature. Edgar T. Ensign reported on the forests of Colorado, Abbot Kinney on Southern California, and Filibert Roth on the forests of Wisconsin. V. M. Spaulding produced a valuable monograph on eastern white pine, Charles Mohr on the pines of southeastern United States, and George B. Sudworth on tree nomenclature. Sudworth would continue to produce important dendrological works. Frederick V. Coville made seminal contributions toward understanding the forest range. This representative list could be longer, but it is impressive enough in abbreviated form.

Within the Department of Agriculture, however, not all were satisfied with Fernow's accomplishments. Over the years he had been saddled with secretaries disinterested in substantive investigations, preferring instead that the Division of Forestry send seed packets to mollify congressional constituencies or engage in rainmaking experiments. Fernow's timber testing studies, painstakingly conducted, drew criticism because he published only after acquiring large quantities of data. Publish more quickly, he was told by Morton's assistant secretary. Morton himself, although he had supported the project, eventually thought an extensive timber-testing study to have been impractical experimentation.[63]

(Two sentences deleted here.)

No longer secretary, Morton got in one last jibe at Fernow, referring to him as one who was "presumed to know something of the theories of European forestry." Fernow heard of this criticism and was naturally hurt. He told Morton that he had known him to be "thoroughly inconsiderate, injudicious and irresponsible" but, using a Prussian twist of phrase, had always believed him to be

"fair, just and sincere." Fernow was grieved to be mistaken. Typically, he offered Morton the opportunity to apologize. Receiving none, he knew "what to think of you and this, I suppose, ends the matter."[64/]

Fernow received another slight when he summarized the efforts of twelve years, a substantial contribution to professional literature in its own right. In his letter of transmittal to the voluminous report, the new secretary of agriculture, James Wilson, called special attention to the fact that Fernow's successor was working in "distinctly different channels." He added, "These plans meet with my full approval."[65/]

This successor who was charting new courses was, of course, Gifford Pinchot. His selection must have surprised Fernow, who as late as mid-April 1898, believed that his assistant, Charles Keffer, would be named to replace him.

Fernow had drafted a bill for the New York legislature to establish a forestry school at Cornell with a 30,000-acre experimental forest; on April 15, 1898 he was elected director of the new college. He was jubilant. "It is my intention to take the timber physics work with me and I hope by and by it will thrive to the glory of another institution than the one in which I have tried in vain to bring it to recognition."[66/]

At Cornell, Fernow began the first professional forestry school in America in the fall of 1898. Within a few years, controversy prompted the New York State governor to veto the program; whether or not Fernow's application of forestry to state lands caused the cancellation is still a matter of debate. In 1907, Fernow moved to the University of Toronto as head of the newly organized forestry faculty. He retired from teaching in 1919. Between 1903

and 1916 he was editor of Forestry Quarterly. In 1917 the Quarterly merged with the Proceedings of the Society of American Foresters to become the Journal of Forestry. Fernow was editor-in-chief until 1923. In addition to his editorial achievements he published over 250 articles and bulletins and three books. His Economics of Forestry in 1902 clearly demonstrates a sophisticated grasp of modern forestry concepts. A Brief History of Forestry, in three editions, although dated in some respects, has yet to be fully replaced. He also wrote Care of Trees.[67]

Fernow's influence in key legislation cannot be disparaged, nor his contributions to technical forestry subjects. He was a cultured, highly educated scientist, out of place in rustic America with its partisan politics and spoils system. Being overly sensitive to real or imagined slights reduced his potential as chief of the Division of Forestry. But despite accusations that he advocated adoption of European forestry methods in America, Fernow understood the forestry needs of the time and set out to fulfill them.

Fernow has suffered much neglect and abuse at the hands of those wishing to give his successor credit for nearly every early advance in American forestry. Pinchot, himself, contributed significantly to his own reputation by diminishing Fernow's. At his retirement from teaching, Fernow must have been pleased to receive widespread praise. Two letters in particular were especially apt: "No other man has been such a potent force in the advancement of forestry in this country and the wonderful foundation laid by you will always endure." From a fellow immigrant whom Fernow had fostered, "You have been more than a teacher of forestry; ...you were a leader of life."[68] Fernow died on February 6, 1923.

Bernhard Eduard Fernow 1851-1923

Raymond, civil engr.
Bernhard " mechan. engr.
" lawyer,

A Son, one of four (Rossiter, Edward, Fritz, and Karl) was a professor of plant physiology at Cornell University, and had his office in Fernow Hall there. (From Ted Fearnow, retired USFS, Berkeley Springs, W. Va.)
A daughter, Miss Gordon Fernow, died of blood poisoning in 1892.

pathology?

(Names of children from Andrew D. Rodgers III book, Bernhard Eduard Fernow, Princeton Univ. Press, N.J. 1951).

A granddaughter, Miss Gordon Fernow, lives in the Philadelphia suburbs.

Many descendants attended a 100th anniversary celebration at Bedford Springs, Pa. some years ago. — 1951?

Mrs. Olivia Reynolds Fernow, 87, widow of B. E. Fernow, died Jet. 12, 1940 at the home of her son Karl H. Fernow near Ithaca N. Y., where she had resided for the last 3 years.

Service Bulletin, USFS.
March 4, 1940
P. 10

She visited Pisgah N.F. office around April, 1924 while visiting in Asheville, N.C.
Service Bulletin Apr. 28, 1924, p. 10

A great-grand-daughter is working in urban fores in Cheyenne, Wyoming (1980. She left that position in 19 to work for the Bureau of Indian affairs on a tribe in western or northern Wyoming, according to a Forest Service informan

an even disposition, great common sense, an indomitable will and energy and tireless enterprise. The growth of Traverse City from a small lumber village to a prosperous manufacturing center was chiefly due to his public spirit and business generalship. He was married at Batavia, N. Y., in 1855, to Catherine Ruth, daughter of Rev. Lucius Smith, and two children survive him: Olive, wife of Charles A. H. McCauley, U. S. Army, and Katherine, wife of R. Floyd Clinch. He died at Highland Park, Ill., Mar. [illegible], 1918.

FERNOW, Bernhard Eduard, forester, was born at Tiowraclaw, province of Posen, Prussia, Jan. 7, 1851, son of Eduard and Clara (Nordman) Fernow. He was educated at the gymnasium, Bromberg, Posen, at the University of Koenigsberg, and the Forest Academy, Münden. During 1869–76 he was employed by the government of Prussia. Coming to the United States in 1876, he established in Brooklyn electrolytic works for utilizing tin-scrap two years later, and subsequently was manager of forest properties in Pennsylvania. In 1883 he was appointed secretary of the American Forestry Association and served for six years. He was chief of the division of forestry, U. S. department of agriculture, during 1886–98, and organizer and director of the New York State College of Forestry, connected with Cornell University, the first forestry school in the United States, during 1898–1903. He edited "The Forester" in 1897, and later was editor and publisher of "Forestry Quarterly." During 1906–07 he was professor of forestry at the State College of Pennsylvania, and from 1907 to 1919 was dean and organizer of the faculty of forestry at the University of Toronto, the first in Canada. He was a member of the conservation commission of Canada from 1910 until his death, and editor of the "Journal of Forestry" from 1916 until the close of his life. He was a member of the jury of awards at the World's fair, Chicago, in 1893, at the Atlanta exposition in 1895, and at the Pan-American exposition in Buffalo in 1901. He was the author of "The White Pine" (1889); "Report Upon Forestry Investigation of U. S. Department of Agriculture, 1877–98" (1899), and "Economics of Forestry" (1903); "A Brief History of Forestry" (1910), and "The Care of Trees in Lawn, Park and Street." His "Economics of Forestry" was the first work of the kind in the English language and a valuable contribution to economic science, as well as to the technical literature of forestry. The honorary degree of LL.D. was conferred upon him by the University of Wisconsin in 1896, Queen's University (Kingston) in 1903, and the University of Toronto in 1920. He was a fellow and vice-president of the American Association for the Advancement of Science; member of the American Institute of Mining Engineers; vice-president of the American Forestry Association; director of the Canadian Forestry Association; president of the Society of American Foresters, and of the Canadian Forest Engineers; and honorary member of the Swedish Society of Forest Engineers and of the English Arboricultural Society. Dr. Fernow was married in Brooklyn, N. Y., in June, 1870, to Olivia Reynolds, daughter of Thomas Reynolds, a merchant, and they had four sons: Rossiter Raymond, civil engineer; Bernhard Edward, mechanical engineer; Fritz, lawyer; and Karl Fernow, plant pathologist. He died in Toronto, Ontario, Canada, Feb. 6, 1923.

ROSS, Walter Daniel, merchant, was born at West Boylston, Mass., July 29, 1858, son of William J. and Maria E. (Loring) Ross, and cousin of Luther Burbank (q.v.). His father, a native of West Boylston, was a farmer and a man of considerable inventive ability. The son received his education in the public schools of West Boylston, and when twenty-three years of age settled at Worcester, Mass., where he entered the service of William H. Earle, a dealer in grass seeds. Seven years later he and his brother, Henry F. Ross, took over this business and conducted it under the name of Ross Bros. In 1895 the firm was incorporated as the Ross Bros. Co. and Walter D. Ross was made president and treasurer, positions which he occupied during the remainder of his life. The company dealt extensively in grass, field and flower seeds, agricultural implements, fertilizer and poultry supplies. Its market was international and in 1899 it furnished seeds and implements to the Japanese government for the establishment of an agricultural college experiment station at Sapporo, Japan. Mr. Ross was a member of the New England Agricultural Society, the Massachusetts Horticultural Society, the Worcester Agricultural Society (president), the Worcester Horticultural Society, the Worcester Grange and the Worcester County Harvest Club. He was also a member of the Chamber of Commerce, the Commercial Travelers' Association of America, and the Economic, the Kiwanis and the Country clubs of Worcester. He was also an active member of the Masonic fraternity, the Congregational church, and in his political affiliations a Republican. Mr. Ross was a lover of nature and a man of scientific mind, peculiarly successful in floriculture and horticulture. He was twice married: (1) Nov. 22, 1886, to Mabel Newton of Worcester, Mass.; she died in 1898, and he was married (2) Feb. 15, 1900, to Mary, daughter of Louis E. Eldridge, also of Worcester. He had two children: Hazel and Eloise E. Ross. He died in Worcester, Jan. 9, 1922.

HARRIS, James Armstrong, horticulturist, was born at Yalaha-on Lake Harris, Lake co., Fla., Feb. 5, 1847, son of Ebenezer J. and Sarah (MacDonald) Harris. He was graduated at Poughkeepsie College, and, although very young for military service, served with Footman's cavalry in Florida during the closing years of the civil war. In 1870 he purchased 325 acres on the shore of Orange lake, entirely covered with wild orange trees, and he converted these sour fruit-bearing trees into sweet ones. He was a pioneer in the work, and from that event dates the history of commercial orange growing in Florida. He was called the father of the Florida orange industry and was popularly known as the "orange king." As his operations in the orange industry antedated the building of railroads in that section of the state, he was compelled to transport his fruit nine miles to the Ocklawaha river, whence it was shipped by steamer via Jacksonville to New York. He was instrumental in the extension of the Florida Peninsula (now the Seaboard Air Line) railroad from Waldo to Ocala by the purchase of freight certificates, and the extension of the line through his orchards greatly facilitated the shipment of fruit. Subsequently he planted a large orange grove on Panasoffkee Lake, in Sumter county, Fla. The development of the orange-growing industry and the building of this road gave rise to the towns of Citra, Sparr, Anthony and Oak, now prosperous communities. He was one of the first to [illegible]

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Biographical Sketch of Bernhard Eduard Fernow

By Frank J. Harmon

Bernhard E. Fernow (1851-1923) was the first professional forester to practice in North America and did more to advance the profession in the United States and Canada in its early years than any other man, including Gifford Pinchot who disparaged him in his autobiography. Fernow received his training and experience at the Muenden forest academy and with the forestry service of his native Germany before emigrating to this country in 1876 where he married an American and became a citizen. His first contacts with American forests occurred in 1878 as manager of a charcoal iron furnace for the Cooper-Hewitt Company in Pennsylvania, supplied by wood from 15,000 acres of forest. He wrote on forestry then for a charcoal iron magazine.

Fernow was a leader in the new American Forestry Association during and for many years after its merger with the American Forest Congress in 1882 at Montreal, and long served as its editor. His ability and professional training were recognized by President Cleveland who made him Chief of the Division of Forestry in the Department of Agriculture in 1886, a position he held for 12 years. He quickly assembled a qualified staff, started forestry research in silviculture, pathology, wood technology, forest products, and tree planting in the Great Plains, and prepared over 200 articles, addresses, and monographs, and over 50 circulars and bulletins which laid the groundwork for forestry in North America. He traveled and wrote and spoke widely to scientists, students, and the public. He was perhaps the first to emphasize here that forestry meant forest management that would allow

natural regeneration to provide a sustained yield of products, and that forestry should be economically practical, with government serving an essential role in managing its own extensive holdings and to guide private industry, including farmers' woodlots.

Fernow strongly urged college instruction in forestry, and himself started and directed the first four-year forestry schools in the United States (in 1898 at Cornell University in New York) and in Canada (in 1907 at University of Toronto), and started and taught at the school at Pennsylvania State College (also in 1907). He taught at Pinchot's school at Yale in 1904. He was a major figure in promoting and establishing the Adirondack Forest Reserve and State Commission in New York in 1885, where he met Theodore Roosevelt, and in securing the Federal legislation for setting aside U.S. forest reserves (passed in 1891) and managing them (passed in 1897). Using legal training gained in Germany he drafted model bills for all this legislation and for similar laws in other States, including laws for fire protection and setting up State forestry agencies. Fernow's attempt to combine practical commercial forestry on a demonstration forest in the Adirondacks with his forestry school at Cornell led to a dispute with wealthy influential adjoining summer estate owners who succeeded in closing his school in 1903. From 1903 to 1907 he was very active as a consulting forester in the Northeast, the South, Cuba, and Mexico, examining large properties and keeping several timber cruisers and surveyors busy even in winter.

Fernow started the Forestry Quarterly in 1902 and was its editor until its merger with the Proceedings of the Society of American

Foresters in 1916, whereupon he became editor of the renamed Journal of Forestry. He wrote three books which became standard texts: The Economics of Forestry (1902), A Brief History of Forestry (1913), and The Care of Trees (1910). He served as president of the Society in 1914, and was made a Fellow in 1918. He helped organize and was first president of the Canadian Society of Forest Engineers, and served for 13 years on the Canadian Conservation Commission. He led a drive for better forest fire control in Canada, for enactment of the Dominion Forest Reserves and Park Act of 1913, and for forest research in Canada. He was a vice-president of the American Association for the Advancement of Science in 1895 when he asked Congress for aid to State colleges for forestry schools. He received honorary LLD. degrees from three universities. Upon his death the Journal of Forestry published tributes from many of the leading professional foresters of that period, many of whom had been his students. In 1922, Fernow Hall at Cornell was named and dedicated in his honor.

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FHARMON:ac:12/15/80:2454A

Journal of Forestry - 1923
Vol. 21, No. 4.

Fernow obituary and comments
runs from page 306 to p. 337.

FOREST HISTORY

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DR. FERNOW, THE PIONEER

By W. B. Greeley
Forester

We have always thought of Dr. Fernow as the pioneer forester in the United States. But it is indeed astonishing to note how completely, during his fruitful years as head of the Bureau of Forestry, the important movements were initiated which in their subsequent force and momentum have carried forest conservation in this country to where it stands today. He gave America her start in forest literature, with a series of monographs and bulletins whose number, breadth of field, and technical quality were phenomenal, particularly in view of the limited resources for research at his command. Not only did he lay the beginnings of the science of silviculture in the United States; he initiated the technical study of wood utilization, the research into timber physics and allied subjects which has subsequently grown to such large proportions and have brought such admirable results in conservation through better use of the timber which we already have.

His influence was felt in practically every State law dealing with forestry which was enacted during this period, the foundation stones of the State Forestry Departments and forest policies which are now taking such a large and splendid part in making the American people a timber growing nation. He started the forest plantations in the Nebraska sandhills, a striking prophecy of the progress to be made in tree planting. He was largely instrumental in securing the enactment in 1891 of the law which authorized the creation of Federal forest reserves from the public domain, an epochal event which initiated the National Forest system as it exists today. Through his unremitting work as a lecturer and publicist, through his large part in creating the American Forestry Association, through the cooperation which he secured from many prominent men of science, and through such far-sighted undertakings as the forestry exhibit at the World's Fair in 1893, he laid the basis for the education of the American people in forest conservation, for creating the popular understanding of the forest needs of the United States and the public sentiment which has made possible every successive development in public forest policies.

More than all this, he stamped upon the forestry movement of the United States its aggressive, missionary character. And, in importance equal to that of any of his other services, he initiated technical forestry education in the United States. It is a far cry from our forest schools of today back to the first course of technical lectures given by Dr. Fernow at the Massachusetts Agricultural College in 1887. But Dr. Fernow not only had the vision to foresee the need for a profession of trained foresters in the United States; he had a tremendous gift, as an instructor, of inspiring students with true professional zest and ideals. Particularly at its early and formative stage, he rendered an immeasurable service toward creating a profession of trained men not only with the technical qualifications but with the enthusiasm and zeal needed to carry forward the various lines of forestry work which he himself so largely initiated.

DR. B. E. FI

BY THE PRESIDEN

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Dr. Fernow the Pioneer by William B. Greeley,
Journal of Forestry, Vol. 21, No. 4, 1923
pages 307-308

REMARKS:

REFERENCE SOURCE OF THE REQUESTED PUBLICATION, IF AVAILABLE:

PART 1- REQUESTOR'S COPY

History of the Division of Forestry, USDA

(McGraw-Hill, N.Y., 1956)

The Division under Hough. Hough tackled his encyclopedic assignment with energy and enthusiasm. In the absence of funds for travel or the employment of assistants, he had to compile the facts for his report by reading and correspondence. He was a tireless letter writer and succeeded in collecting an amazing amount of information from persons having some knowledge of the subject of his inquiries both at home and abroad. The result was the monumental *Report upon Forestry* (650 pages) prepared in 1877 and published in an edition of 25,000 copies in 1878. This report constitutes a comprehensive collection of information of the most heterogeneous character. The material varied in quality from the trivial to the highly significant but is all of historical interest as representing current information and thinking on the subjects treated.

The second *Report upon Forestry* was published in 1880 and ran to 618 pages, of which nearly 500 pages were devoted to United States exports and imports of forest products and to the timber resources and timber trade of Canada. The remainder of the report dealt mainly with the Timber Culture Act of 1878, with timber on the public lands, with recent state and territorial legislation relating to forestry, and with miscellaneous topics.

Hough's third report, published in 1882, shrank to a mere 318 pages. As usual it covered a wide variety of subjects, but with major attention to forest fires, the importance of which was strongly stressed. With respect to timber on the public lands, he expressed his agreement with the reservation policy proposed by Schurz and Williamson:

> We would therefore earnestly recommend *that the principal bodies of timber land still remaining the property of the government . . . be withdrawn from sale or grant under the existing modes for conveying the public lands, and that they be placed under regulations calculated to secure an economical use of the existing timber, and a proper revenue from its sale, the title being retained by the government, and the young timber, in all leases for cutting, being reserved and protected for a future supply.*

The report also urged vigorously the establishment of forest experiment stations in various parts of the country and discussed the importance of meteorological observations as a means of determining the effect of forests on climate. Many of the views with respect to forest research and forest influences expressed in this report were doubtless influenced by a trip which he had made to Europe in 1881.

The general character of Hough's three reports, because of which he was awarded a diploma by the Vienna International Congress of 1882, was well summarized by Fernow in 1899 as follows:

> The appropriations being extremely limited, special original research was excluded, and Dr. Hough being acquainted with the subject as an interested

layman and not as a professional forester, these reports, while valuable compilations of facts from various sources, naturally did not contain any original matter, except such suggestions as Dr. Hough could make with regard to the duties of the Government with reference to the forestry interests of the country and especially of the public domain.

Certainly he was one of the outstanding leaders of the day in bringing about public appreciation of the importance of the country's forest resources and of the need for their conservative management. In addition to his official reports, Hough wrote a book entitled "The Elements of Forestry," published in 1882, which constituted the first American textbook on the subject.

The Division under Egleston. By 1881 the studies and other activities of the Department of Agriculture relating to forestry had attained sufficient scope and stability to justify their recognition by the Commissioner for administrative purposes as the Division of Forestry. Two years later (1883) Hough was replaced as chief of the Division by Nathaniel H. Egleston of Massachusetts, a former minister with little previous experience in the field. Hough continued his services as an "agent" in the Division. Whatever the reasons for the change, they were not based on the relative competence of the two men.

In his first annual report (for 1883) to the Commissioner of Agriculture, Egleston went all out in his emphasis on the indispensability of forests as a basis for urging Federal action in their protection:

> The Government cannot interfere with or regulate the use or consumption of forests which belong to individuals, corporations, or the separate States. That must be left to the influence of increased and diffused knowledge and enlightened self-interest. But nothing seems clearer than that the Government should take care of its own property and use it for the general welfare. And today it has no property so valuable as its forests. Its mines, its forts, its ships, the coined money in its vaults, taken together, are hardly comparable with them. These might all be lost without essential or permanent injury to the nation, while the loss of the forests would threaten desolation and national decay and destruction.

In addition to his advocacy of governmental action to protect the timber on the public lands, he recommended establishment by the government of forest schools and of forest experiment stations at the capital and in other parts of the country, including "that peculiar region, the Pacific."

The fourth and final special *Report on Forestry* was published in 1884 under Egleston's name. It was less heterogeneous than its predecessors and consisted mainly of reports by agents of the Division, four of them by Hough, on tree planting, timber culture, forest conditions, and the

utilization of forest products. One of its most interesting parts was a county-by-county presentation of the results of tree planting in the Prairie states, with a list of the trees that had proved successful and unsuccessful. Most prominent among the reasons for failure were drought, freezing, insects, prairie fires, negligence, and lack of knowledge and experience.

Fernow Takes Over. In 1886 Congress granted statutory recognition, previously lacking, to the Division of Forestry. That same year, Bernhard Eduard Fernow became its chief, a Republican chosen by a Democratic administration as the only man in the country with the requisite professional qualifications for the office.

Fernow was a German who had received professional training in forestry at the well-known school of forestry at Muenden in the Province of Hannover in western Prussia, followed by several years of practical experience in the diverse forests of Silesia, Brandenburg, and East Prussia. He had come to the United States in 1875 at the age of twenty-five ostensibly to attend the Centennial Exposition at Philadelphia, but actually to marry an American girl to whom he had become engaged while she was on a visit to Germany. He became a citizen of the United States on December 14, 1883.

Prior to his appointment in the Federal service, Fernow had spent most of his time in the management of iron furnaces for Cooper, Hewitt and Co. in Pennsylvania. This position he owed to his friend and mentor Rossiter W. Raymond, who as United States Commissioner of Mines and Mining had observed and warned of the destruction of the forests. Fernow's work included the management of 15,000 acres of hardwoods to supply charcoal for the iron works, and he made the most of the opportunity to study American forest conditions on the ground. He had first come to the attention of the growing group of men interested in forestry matters at the American Forestry Congress at Cincinnati in 1882, at which he read a paper and of which he later served as secretary for several years.

With Fernow's advent the work of the Division of Forestry took a new slant. While the Division of necessity continued to be primarily a bureau of information and investigation, the fact that its activities were now under the direction of a professional forester gave them a different tone. In particular Fernow stressed forest management as a much broader and more fundamental aspect of forestry than forest "culture," which had come to mean little more than reforestation by tree planting. To him the real objective was to protect and harvest the forest so as to avoid the need for planting. In season and out, he preached the doctrine that forestry should start with the forest, not with bare land. Like his prede-

cessors he favored the establishment of forest experiment stations as a means of providing the basic information on which sound forest management must rest.

Research and Education. Under Fernow's direction, the research work of the Division became more intensive and more professional in character. It covered the entire scope of forestry, which he described as resting on three main bases: (1) scientific basis, including forest biology, timber physics, and soil physics and soil chemistry; (2) economic basis, including statistics, technology (applied timber physics), and forest policy; and (3) practical basis, including organization of the forest, management of the forest, forest regulation, and harvest. Although he believed that forests have an effect on precipitation, he succeeded in getting excused from spending $2,000 appropriated by Congress in 1890 for conduct by the Division of experiments in the artificial production of rain.

An important innovation in the work of the Division was the inauguration of research in "timber physics," which Fernow defined as comprising "not only the anatomy, the chemical composition, the physical and mechanical properties of wood, but also its diseases and defects and a knowledge of the influences and conditions which determine structural, physical, chemical, mechanical, and technical properties." The new field, he pointed out, had economic as well as scientific utility since "the properties upon which the use of wood, its technology, is based should be well-known to the forest manager if he wishes to produce a crop of given quality useful for definite purposes."

Education, both popular and professional, was also close to Fernow's heart. During his second year as Chief of the Division of Forestry he addressed a circular to educational men in which he said:

> Schools of every grade, without departing at all from their proper work, can supply some practical lessons in regard to the objects and use of forests, the nature and growth of trees, and the significance of their existence or absence, awakening thereby the interest of pupils in a kind of knowledge too little fostered in the schools of the agricultural classes. At schools of the higher grade it can be united with instruction in botany and natural history in general. In colleges forestry should be presented in lectures on its various relations to arboriculture, agriculture, and political economy.

These suggestions are wholly in line with modern efforts to have some knowledge of forestry, and also of the conservation of other natural resources, acquired by students at all levels in the educational system as an integral part of their study of other subjects. Fernow's own speeches and articles were commonly educational in character and included several series of lectures at institutions of higher learning.

"Providential Functions of Government." Fernow shared the views of many other farseeing men of the day about the dangers inherent in the forest destruction that was proceeding at an accelerating rate, and particularly about the depredations on the public lands. In 1887, as a result of a trip to the Rocky Mountains, he found it to be admitted everywhere "that the present conditions of administration have become insufferable and that the practical forestry work of the Government should first of all be directed to the protection and proper administration of its timber lands." To this end he prepared the draft of a bill providing for the establishment and management of forest reservations which was introduced by Senator Hale of Maine and helped to pave the way for the forest-reserve provision in the General Revision Act of 1891.

Land Law

Closely connected with Fernow's efforts to obtain Federal reservation and administration of the public timberlands was his belief that government must take the leadership in other directions in promoting the conservation of natural resources. The view that the future of the country cannot be left wholly to the operation of enlightened self-interest, at least with respect to the basic means of subsistence, was forcefully expressed in an address entitled "The Providential Functions of Government with Special Reference to Natural Resources," which he delivered before the A.A.A.S. in 1895 as vice-president of its Section on Social and Economic Science.

In this address he pointed out that "a nation may cease to exist as well by the decay of its resources as by the extinction of its patriotic spirit." With respect to forests, he stated that

> the forest resource is one, that under the active competition of private enterprise is apt to deteriorate and in its deterioration to affect other conditions of material existence unfavorably; that the maintenance of continued supplies, as well as of favorable conditions, is possible only under the supervision of permanent institutions, with whom present profit is not the only motive. It calls preeminently for the exercise of the providential functions of the State to counteract the destructive tendencies of private exploitation. In some cases restriction of the latter may suffice, in others ownership by the State or some smaller part of the community is necessary.

In spite of discouragingly meager appropriations, the Division of Forestry under Fernow's leadership had a marked influence on the thought and action of the country in forestry affairs. In addition to its specific activities in the fields of education and research, it focused public attention on the main issues involved in the forest problem, helped to make Federal forest reserves an accomplished fact, and in general paved the way for the remarkable developments that were to take place after the turn of the century.

From Forest and Range Policy by Samuel T. Dana
McGraw-Hill, N.Y. 1956.

American Forestry Association. In 1873, John A. Warder, an Ohio physician, pomologist, landscape gardener, and amateur forester, was one of the United States commissioners to the International Exhibition at Vienna, where he made a special study of forests, forest products, and forestry. Although denied by the State Department the opportunity to study forest conditions and forest practices in the forests themselves, he prepared a comprehensive report on European forestry which was published in 1876 as a House document. In this report he stressed the fact that forestry, "though quite unknown as an art in our country," must receive greater attention than heretofore. "The increasing scarcity of timber within the first century of the nation's history and that in a country famous for the richness and value of its sylva, and for the extent of its woodlands, is a subject that calls for the most serious consideration of the statesman, and perhaps also for the interference and care of government."

On September 10, 1875, the American Forestry Association was organized at the Grand Pacific Hotel in Chicago under Warder's leadership. He became its first president and continued in that capacity until the association was amalgamated with the American Forestry Congress in 1882. Fernow's biographer, Andrew Denny Rodgers III, characterizes Warder as "the leading figure of the early forestry movement in America" and "the founder of the first organized effort in the cause of forestry in America."

The next meeting of the American Forestry Association was held at Philadelphia on September 15, 1876. At that time it absorbed the American Forestry Council, a small group which had been formed following the 1873 meeting of the A.A.A.S. but which had never been active. At its 1880 meeting in Washington, the association asked Congress to appoint a commission to study forestry in Europe, and the next year Hough was sent abroad for that purpose. However, the association did not thrive, and its last meeting was held at Rochester, New York, on June 29, 1882, when plans were made for the anticipated union with the American Forestry Congress.

American Forestry Congress. The first American Forestry Congress was organized as an entirely distinct entity from the association, although Warder took a prominent part in its organization and presented no less than six papers at the congress itself. The motivation for such a conference resulted from a visit by Oberförster Baron Richard von Steuben to Cincinnati, during the course of which he commented on the need for constructive action to check forest destruction and encourage forest management in the United States. Whether or not local politics also became

involved, as has been alleged, there can be no doubt as to the sin of those who arranged the literary part of the program.

The meeting was held at Cincinnati, Ohio, April 24 to 29, 1882, great fanfare. Some 30,000 invitations were distributed; there w parade of 60,000 school children; and Ohio's first Arbor Day was brated by initiating "a movement in miniature of the great schem replanting our denuded hills and valleys by planting groves of tree each of our Presidents, and to the memory of . . . many poets, ora and statesmen." The more spectacular part of the program was sup mented by the presentation, in full or by title, of eighty-seven pa covering a wide diversity of subjects.

The congress decided to perpetuate itself as a permanent organiza and adopted a constitution the first article of which read: "The objec this Congress shall be to encourage the protection and planting of fo and ornamental trees, and to promote forest culture." The initial meml ship comprised seventy-three persons, including nearly all of those pro nent in the forestry movement with the notable exception of Carl Sch and Charles S. Sargent, who did not attend. Although there is perh some question as to how much the congress contributed to real progr in forestry, it aroused widespread popular interest and established or permanent basis an organization that was later to exercise a power influence in forestry affairs.

Subsequent Meetings. The next meeting of the American Fore Congress was held at Montreal in August, 1882. At this meeting the old American Forestry Association was absorbed and its members welcome as full-fledged members of the congress. Fewer papers were presente than at the Cincinnati meeting, but on the whole they were perhaps a b more substantial in character. Of special interest was a paper by J. H Ward of Montreal entitled "A Few Practical Remarks from the Lumbe man's Standpoint," since that standpoint seldom found expression in th discussions of the day. A resolution adopted by the congress bestowe upon James Little, a veteran lumberman who had fought for years fo the preservation of Canada's pine forests, the honorary appellation o "Nestor in American forestry"—a variation on the "father" title whic Fernow later applied to Warder.

King of Pylos. Served in old age as counselor to the Greeks at Troy. (a patriarch or leader).

Subsequent meetings of the congress were held at St. Paul, Washingto Saratoga, Boston, Denver, Springfield (Illinois), and Atlanta. The meet ing at Atlanta in 1888 was held in conjunction with the Southern Forestr Congress and resulted in a consolidation of the two organizations. Th next year (1889) the combined organizations assumed the name Th American Forestry Association. Under that name it has since continue its efforts as a popular organization, with membership open to all in

terested persons, to promote public understanding and support of sound national, state, and private forest policies—on numerous occasions with marked success.

In 1883 Fernow became corresponding secretary of the American Forestry Congress, a position which he held until 1888. From then until 1898 he served as chairman of the executive committee of the congress and the association, and from 1885 to 1898 he was editor of the *Proceedings*. His simultaneous occupation of these positions and of the position as Chief of the Division of Forestry put him in a strategic position to exercise great influence in the development of forest policy during this critical period.

Other Educational Activities. Minnesota in 1876 had the honor of establishing the first state forestry association. That same year, the state legislature appropriated $2,500, and the next year $2,000, to advance the objects of the association. The funds were used chiefly to promote tree planting, which was done on an extensive scale.

During the next ten years state forestry associations were organized in Ohio, Colorado, New York, and Pennsylvania. The Pennsylvania Forestry Association, organized in 1886, immediately started publication of a periodical *Forest Leaves*, which has had an enviable record of continuous publication from that date to this—since the winter issue of 1951 under the name *Pennsylvania Forests*.

In 1882, Hough undertook as a private enterprise to serve as editor of *The American Journal of Forestry*—a periodical "devoted to the interests of forest tree planting, the formation and care of woodlands, and ornamental planting generally, and to the various economies therein concerned." This undertaking had been suggested by Hough at the Philadelphia meeting of the American Forestry Association in 1876, when he pointed out the need for "a journal that shall do for forestry what the *American Journal of Science and Art* has done for the sciences generally." The suggestion was renewed at the Cincinnati meeting of the American Forestry Congress in 1882, and Hough was doubtless encouraged by the enthusiasm with which it was received.

The American Journal of Forestry was a highly useful monthly publication, containing original articles on all phases of tree planting and forestry, notes on current events, and bibliographic notices. Unfortunately the financial support which it received did not justify its continuation. It ran for one full year—from October, 1882, to September, 1883—when the editor and publishers announced its final suspension because its slender patronage amounted to less than the cost of publication. Hough had appraised the situation correctly in 1876 when he said, "The time will surely come when such an enterprise will be demanded, and will be sustained, although perhaps not now."

In 1884, Fernow began publication of a *Forestry Bulletin,* but it la for only three issues. Sargent had better success with *Garden and Fo* which he started in 1888 as a journal of horticulture, landscape garden and forestry, and which continued until 1897. It appealed to a wide a ence and was used by Sargent, among other things, as a vehicle expressing his support of the establishment and businesslike adminis tion of forest reserves. Two other works by Sargent which appeared in t 1880's and 1890's deserve special mention. These are the *Report on t Forests of North America* (1884), prepared for the Tenth Census a presenting the first truly comprehensive picture of the forest resources the country, and the fourteen-volume "Silva of North America" (189 1902), which is by far the most complete taxonomy of the trees of t continent yet to be published.

Move to Establish a School of Forestry. In 1880 the Chamber of Co merce of St. Paul, Minnesota, petitioned Congress to grant 300 sectio (192,000 acres) of public land to the state of Minnesota for the establis ment of a school of forestry. The idea was doubtless suggested b General C. C. Andrews, who served as chairman of the chamber's speci committee on the subject. His interest in forestry had been aroused whil he was Ambassador to Sweden, and in 1872 he had submitted to the Stat Department an excellent report on forests and forest culture in tha country.

Before submitting the memorial to Congress, the chamber solicited th views of a number of distinguished persons as to the merits of the pro posal. Of the fourteen replies received, twelve were favorable. The tw unfavorable replies were from President Charles W. Eliot and Dr. Charle S. Sargent, both of Harvard University.

President Eliot did not think that such a technical school should b free; did not see why the one interest of forestry should be selected fo such support rather than any other considerable industrial or commercial interest; and believed that if the government were going to spend money at all for education it should be for elementary education.

Aside from the propriety of the proposed subsidy, Dr. Sargent opposed the plan because "there are no teachers to teach and no scholars who want to be taught." He believed that the need for such schools would arise in time and that in the meanwhile attention should be devoted to the establishment of forest experiment stations. On the other hand, J. D. Ludden, a Minnesota lumberman, expressed the view that there was already a large and most inviting field for men thoroughly educated in the science and practice of forestry.

A bill providing aid for a school of forestry to be established at St. Paul was introduced in Congress by Senator McMillan of Minnesota in 1880,

)Written for Forest History Society's Encyclopedia of American Forestry) December 1980 (Short version)

Biographical Sketch of Bernhard Eduard Fernow

By Frank J. Harmon

Bernhard E. Fernow (1851-1923) was the first professional forester to practice in North America and did more to advance the profession in the United States and Canada in its early years than any other man. Fernow received his training and experience at the Muenden forest academy and with the forestry service of his native Germany. In 1878 he became manager of a charcoal iron furnace in Pennsylvania.

Fernow was a leader in the American Forestry Association and long served as its editor. President Cleveland made him Chief of the Division of Forestry in the Department of Agriculture in 1886. He quickly assembled a qualified staff, started forestry research in silviculture, pathology, wood technology, forest products, and tree planting in the Great Plains, and prepared over 200 articles, addresses, and monographs, and over 50 circulars and bulletins which laid the groundwork for forestry in North America. He traveled and wrote and spoke widely to scientists, students, and the public. He was perhaps the first to emphasize here that forestry meant forest management that would allow natural regeneration to provide a sustained yield of products, and that forestry should be economically practical. Federal and State governments should, he believed, manage their forest holdings, serving as a guide to lumbermen and farmers.

Fernow strongly urged college instruction in forestry, and himself started and directed the first four-year forestry schools in the United States (in 1898 at Cornell University in New York) and in Canada (in 1907 at University of Toronto), and started and taught at the school at

Pennsylvania State College (also in 1907). He taught at Pinchot's school at Yale in 1904. He was a major figure in promoting and establishing the Adirondack Forest Reserve and State Commission in New York in 1885, where he met Theodore Roosevelt, and in securing Federal legislation for setting aside U.S. forest reserves (passed in 1891) and managing them (passed in 1897). Using legal training gained in Germany he drafted model bills for all this legislation and for similar laws in other States, including laws for fire protection and setting up State forestry agencies. Fernow's attempt to combine practical commercial forestry on a demonstration forest in the Adirondacks with his forestry school at Cornell led to a dispute with wealthy summer estate neighbors who succeeded in closing his school in 1903. From 1903 to 1907 he was very active as a consulting forester in the Northeast, the South, Cuba, and Mexico.

Fernow started the Forestry Quarterly in 1902 and was its editor until its merger with the Proceedings of the Society of American Foresters in 1916, whereupon he became editor of the renamed Journal of Forestry. He wrote three books which became standard texts: The Economics of Forestry (1902), A Brief History of Forestry (1913), and The Care of Trees (1910). He served as president of the Society in 1914, and was made a Fellow in 1918. He helped organize and was first president of the Canadian Society of Forest Engineers, and served for 13 years on the Canadian Conservation Commission. He led a drive for more parks, reserves, research and better forest fire control in Canada. He was a vice-president of the American Association for the Advancement of Science. He received honorary LLD. degrees from three universities.

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U. S. FOREST SERVICE
(Contents Confidential)

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DR. FERNOW DIES AT TORONTO

Dr. Bernard Edward Fernow, author, pioneer educator, organizer of the forestry movement, and the first United States Forester, died on the morning of February 6 at Toronto.

Dr. Fernow was born in Posen, Prussia, in 1851, and studied under the famous Heyer and other noted foresters. He first came to this country in 1876 and soon took an active part in the forestry movement of New York State, where he formulated legislation establishing the Forest Reserve in the Adirondacks. From 1885 to 1898 he was Editor of the Proceedings of the American Forestry Association. Largely because of the activities of this association, the greatest piece of forest legislation so far adopted in our country was enacted - the law of 1891, authorizing the President of the United States to establish National Forest reserves. This act led to the creation of the present National Forests.

In 1886 Dr. Fernow's great work for the nation really began when he accepted the position of organizer and director of the forestry work of the Government for the Department of Agriculture, a position which he occupied until 1898.

During twelve years spent in Washington, Dr. Fernow kept in close touch with the forestry work in the various States, and there was little of State forest legislation passed during this time in which his opinion was not consulted. He secured the cooperation of many prominent men of science. Numerous bulletins and circulars, including monographs on White Pine, the Southern Timber Pines; results of tests and studies in timber physics, the first complete discussion of the metal railway tie as a possible substitute; studies on timber impregnation and other subjects, all of immediate value in wood utilization, are evidence to-day of the painstaking work of the guiding spirit which directed them and edited their results for publication.

Throughout the twelve years in the Bureau of Forestry, Dr. Fernow never ceased to write articles and addresses. In these years the larger part of two hundred articles and addresses, over twenty circulars, and over thirty bulletins and reports were prepared and edited.

In 1898 Dr. Fernow was called to Cornell to organize the first forestry school in the new world. Here he inaugurated the beginnings of professional education. After leaving Cornell he worked for four years as consulting forester. During these four years he continued the Forestry Quarterly; delivered lectures at Yale University, and started the forest school at Pennsylvania State College. In 1907 Dr. Fernow accepted an invitation to Toronto University and organized the first forest school in the Dominion. At the time of his death he was Professor Emeritus of that institution.

His well known "History of Forestry" is a masterpiece of its kind, covering the subject for both the Old and New World.

Three years ago, when Dr. Fernow retired from active teaching, there was published in AMERICAN FORESTRY a tribute by Raphael Zon to the father of forestry in the new world. To-day the words assume an added significance. "While the period which Dr. Fernow typifies is rapidly becoming history, his teachings and his contributions have the quality of

permanence. They have been always a source of inspiration and guidance to the pioneers of forestry; they will be infinitely more so to the actual managers of our forest lands as soon as real woods forestry comes into general practice. As with any great teacher, it is not the kind of theory that he happens to advocate that really counts, but the ability to teach how to think in his particular field. Theories come and go, but the ability to orient oneself in the details of complex problems is a lasting asset; he who teaches to meet ever-changing problems, not by a ready-made theory or hypothesis, but by a critical attitude and ability to discern between the essential and nonessential, is building on a solid foundation. With him forestry was not merely theory, but a movement ever changing as life itself, and for him problems became soluble not in ready-made formulas but in the forces, economic and natural, that are at work."

To Mrs. Fernow the Forest Service has sent the following message: "In this hour of sorrow may the thought console you that Dr. Fernow's work will never die but will be carried on as long as the Forest Service endures. The members of the Forest Service extend to you and your family their deepest sympathy in your loss."--T.H.G. Thomas H. Gill

THE MATTER WITH OUR LAND EXCHANGE BUSINESS

By Clinton C. Smith, D-7

Mr. Kneipp, in a recent issue of the Bulletin, asks "What is the matter with our Land Exchange?" This partial answer is given on the basis of the Florida Exchange Act of July 3, 1916.

If it takes over two years to put an exchange through the Department of the Interior, the effect on the exchange business can readily be anticipated. With four exchanges pending since 1919, no exchanges have been offered since May, 1921. See following table of Florida exchanges to date:

Name of applicant	Date approved Agriculture	Area of Govt. land (selected)	Area of Priv. land (base)	Date patent Interior
Ewing, E. A.	6-7-17	80	164	2-20-18
Harrison, W. W.	7-16-18	3,513	7,373	11-10-20
Sutton & Harrison	12-26-17	749	1,603	10-13-21
Perdon, C. B.	8-16-19	2,311	6,219	
McCaskill, R.E.L.: (Flournoy Lands): (016510)	1-6-20	4,216	11,021	
Bryan, R. E.	11-18-19	2,200	7,107	11-3-22
Bryan, R. E. (Faircloth Land): (016511)	1-14-20	78	321	1-19-23
McCaskill, R.E.L.: (Walton Land & Timber Co.) (016509)	1-6-20	4,904	13,502	
Rose, E. P.	1-26-20	2,440	6,100	
Ratio, 1 to 20	Totals	20,491	53,410	

From Recreation — David Scott. 2-19-80

copy of letter from B. Fernow.

B. E. FERNOW, LL.D.
CONSULTING FOREST ENGINEER

ITHACA, N. Y., ... 190....

Prof E. F. Meany

Dear Prof Meany: The book goes forward — with my compliments.

The College of Forestry is no more, the Governor having vetoed its appropriation (1903), a trick secured by two influential bankers who did not like our logging operations near their camps. We have waged warfare for two years with this result. Some time you will see the matter ventilated in "Science".

If you have access to the Paper Trade Journal of July 9, that has a fair statement.

Yours truly

B. E. Fernow

Ans
31 XII 1903
Ordered
Forestry Quarterly Vols. I, II.

F. Harmon
1975

Early U.S. Forestry Leaders and Chiefs of the Forest Service

Franklin B. Hough (1822-85). A rural New York State physician with very broad natural science interests, great energy, highly retentive memory, an insatiable quest for knowledge, and deep concern for forests, who became a prolific writer and indefatigable promoter of forestry. He was the first Federal official assigned by the Commissioner of Agriculture (Frederick Watts) under a mandate from Congress to gather data and present reports on forestry in the United States and Europe. He was appointed Aug. 30, 1876 and he was made head of the Division of Forestry when the office was given this title in 1881. Besides sending out numerous detailed questionnaires, he made extensive travels to gather data in this country, and in 1881 in Europe.

Hough himself was responsible for the appointment of a forestry agent by the Federal Government, through an appeal he made before the annual meeting of the American Association for the Advancement of Science in Portland, Maine, three years earlier. As forestry agent with very little funds and a very small staff he prepared three voluminous reports for Congress and was largely responsible for the fourth; all were widely acclaimed. He also wrote a basic book, "Elements of Forestry," published in 1882, ~~and a book on practical forestry, "Forestry in the United States," published in 1875~~. He continued on the Division of Forestry staff when a less knowledgeable successor was appointed in 1883, until shortly before his death in 1885.

Hough ~~was superintendent of~~ assisted in the Federal Census of 1870, and twice previously ~~for~~ (directed) the New York State Census, where the sharp decline in lumber production in the Northeast first came to his attention. He ~~was a prolific writer of~~ (wrote countless) letters, speeches, and articles. Despite his nonprofessional status in natural sciences, he read broadly and at length, and made field studies in botany, geology, weather, and statistics, and wrote for professional journals. He was highly esteemed in scientific circles, and is often called the "Father of American forestry.

Nathaniel H. Egleston (1822-1912). A New England Congregational minister interested in forest conservation who became vice-president of the reorganized American Forestry Association in 1882. He was appointed Chief of the Division of Forestry in the U.S. Department of Agriculture in 1883 by the new Commissioner of Agriculture, George B. Loring, who had been elected president of the new American Forestry Association in 1882. Both were from Massachusetts. Egleston needed the assistance of Franklin B. Hough, his predecessor, and retained him. Egleston remained Chief for three years, until the Prussian forester, Bernhard E. Fernow, was appointed as the first professional to head the office. Egleston remained on the staff until retiring in 1898 when Fernow left and the legendary Gifford Pinchot became Chief. While he headed the office, Egleston had tried without success to interest Congress in establishing forest research stations and fostering education in forestry. He wrote a number of articles and booklets on forest preservation and tree culture both before and during his Federal service. After his term as Chief he helped prepare the annual reports on forestry in the Department of Agriculture.

Carl Schurz (1829-1906). A native German (Prussia) who became an American statesman, one of the earliest and most effective advocates of forestry in the United States. He fled Germany after taking part in the unsuccessful democratic revolution of 1848. He practiced law and became influential among the German settlers in Wisconsin, and was a delegate and speaker in Abraham Lincoln's Presidential campaign, and later for Rutherford Hayes who appointed him Secretary of the Interior in 1877. (A strong early opponent of slavery,) He was Senator from Missouri 1869-75, and had supported Horace Greeley for President in 1872 against General Grant. He was briefly Minister to Spain under Lincoln. As Secretary of the Interior he tried hard to strengthen Federal control over disposition and management of public timber and timberlands. He organized a force of special timber agents to conduct a strong drive against widespread raiding and destruction of public (lands) forests. Although his efforts were not very successful at the time, he contributed greatly to changing the public attitude toward forest conservation. He drew up the first comprehensive regulations for Government forest reserves which served as models for those later adopted. Against strong opposition in Congress he successfully introduced Civil Service reforms by requiring competitive examinations. He was a prominent newspaper writer and editor and a prolific writer and speaker for conservation and liberal political causes.

Bernhard E. Fernow (1851-1923). The first professional forester in the United States who remained continuously active as a leader in his field. A native of Germany (Prussia) like Schurz. Arrived in this country in 1876, the Revolutionary Centennial and the year the first Federal forestry agent was appointed. He first became associated with mining where he saw the need for forest conservation. He was appointed secretary of the young American Forestry Association in 1883, serving for five years. In 1888 he became chairman of the AFA executive committee and held the position for 10 years, also serving as editor of its Proceedings and its journal, "The Forester". In 1886 President Cleveland appointed him Chief of the USDA Division of Forestry, as its first professionally trained head. With Schurz he was most influential in securing passage of the Forest Reserve Act of 1891, working on early drafts, and much of his advice on managing the reserves was included in the Organic Act of 1898. He also drafted the bill in New York State which set up the Adirondack and Catskill Forest Preserves and the State Forest Commission in 1885. He did a great deal of writing and speaking to educate the public about forestry. He published the first scientific studies on tree diseases in the U.S., 1887-88, and a series of structural wood tests in following years, in cooperation with Filibert Roth, another German immigrant. He started and was editor of Forestry Quarterly and its successor, Journal of Forestry, official organ of the Society of American Foresters, from 1898 to 1922. He became president of the society in 1916. He delivered the first truly professional forestry lectures in America, at Michigan Agricultural College in 1894. He organized and was Dean of the first 4-year professional forestry school in America, at Cornell University, 1898-1903, and from 1907 to 1919 was Dean of Forestry at the University of Toronto, Canada, a school which he also founded. He wrote many scientific papers about forestry, and published "Economics of Forestry" and "History of Forestry".

Filibert Roth (1858-1925). One of the pioneers in forestry teaching in America, he was an instructor under Dr. Fernow at Cornell (1898-1901), and started the Forestry Department at the Universityof Michigan in 1903, which he headed for 20 years until his retirement. He was the first man with forestry background to have charge of the Federal forest reserves, serving as Chief of the Forest Reserve Division in the old General Land Office (now the Bureau of Land Management) in the Department of the Interior, from 1901 to 1903. Like Fernow and Schurz, he was a native of Germany, coming to this country in 1871. He attended the University of Michigan, 1886-90, studying botany under Prof. V.N. Spalding who interested him in forestry, and began work in wood structure which he pursued with Fernow after joining the USDA Division of Forestry in 1893. He read deeply the current scientific literature in French and German on forestry.

He wrote several booklets and bulletins on forestry and wood technology for the Division, reporting the results of his strength and durability tests of economically valuable timber species. He wrote, with E.T. Allen, the first manual on administering the Federal forest reserves, and the same year wrote for the general public the "First Book of Forestry". As a professor of forestry at Michigan he became widely known and loved as a master teacher, and was affectionately known by his students as "Daddy" Roth. He was State fire warden, 1903-09, and helped organize the Michigan Forestry Association in 1905, and accepted the presidency in 1923. He was long active in the Society of American Foresters, vice-president in 1902 and president in 1917. He represented the United States at the International Forestry Congress in Brussells in 1910.

Chiefs of the Forest Service

Gifford Pinchot (1865-1946). America's first native professional forester and one of its most energetic, effective, and renowned conservation leaders. He was Chief, USDA Division of Forestry, 1898-1901, and remained Chief when it became a Bureau, 1901-1905, and finally a Forest Service, 1905-1910. A native of Pennsylvania and New York City, of a wealthy family, fluent in French, he received his professional training in 1889-90 in France and got several years of private field experience back home before becoming United States' Chief Forester. He attended Yale College 1885-89. From 1892 to 1894 he managed the forests on the Biltmore Estate of William Vanderbilt in the mountains near Asheville, N.C. Pinchot made extensive field studies of the new Federal forest reserves for Congress in 1896, and for the Department of the Interior in 1897. He was influential with the strong support of President Theodore Roosevelt and many other groups and leaders in gaining and mobilizing wide support for transfer of the reserves from Interior to Agriculture, finally ordered by Congress Feb. 1, 1905. He had them renamed National Forests in 1907. The pattern of effective organization and management under central direction but with considerable authority delegated to regional headquarters was set during Pinchot's term. Conservation of natural resources in the broad sense of "wise use" for "the greatest good of the greatest number in the long run" became a widely known concept and an accepted national goal, which it remains to this day. Pinchot became an intimate friend and highly valued associate of Theodore Roosevelt; they were both ardent outdoorsmen and conservationists. Roosevelt approved almost everything Pinchot asked for. The two hard-working aggressive personalities teamed up to advance forestry tremendously in the first decade of the 20th Century. Pinchot developed one of the first and most effective publicity offices of any Government agency.

During Pinchot's period in office, which within three years also coincided with Roosevelt's, the forest agency and the reserves grew spectacularly. When Pinchot became Chief of the old Division in 1898, he had a staff of 12 persons; there were 32 forest reserves covering 56 million acres, and a staff of 734 persons (approximately the present size of the Washington headquarters). When he left in 1910 there were 150 National Forests covering 172 million acres, close to their modern extent and number. Assistance to private forest owners in managing their tracts began in the old Division of Forestry under Pinchot, who provided technical services by his staff to all who asked. When the reserves were put under his control, their operation required nearly all the agency's time. Pinchot began the practice of charging a fee for grazing privileges, which the Supreme Court later sustained, and fees for water power sites and other special uses. He organized two major (broad) conservation conferences for Roosevelt. When William Howard Taft assumed the Presidency, Pinchot's influence diminished. He got into a controversy over Government coal leases in Alaska with the new Secretary of the Interior, Richard Ballinger, so bitter that Taft was forced to dismiss Pinchot.

Pinchot was an outspoken crusader for Federal protection of forest lands and remained an influential figure for the rest of his life. After leaving the Forest Service he for long agitated for Federal regulation of cutting on private lands, warning of an imminent "timber famine". However on this point he was unsuccessful although the issue created a rift among foresters which lasted for years. Gradually industry practices improved, and the States began to impose regulations.

Pinchot organized and was first president of the Society of American Foresters (1900). In that same year he got his family to endow a School of Forestry at Yale University, and released his close assistant, Henry S. Graves, to be its first Dean. He helped organize the Association of State Foresters in 1920, when he became Pennsylvania's Commissioner of Forestry. He also served as Governor of Pennsylvania, 1923-27 and 1931-35.

However it was as a forester that he wished to be remembered, as he stated in his autobiography of his early life through his period of leadership of the Forest Service, "Breaking New Ground". He wrote the first manual of the new agency, "The Use of the Forest Reserves," a very small but practical booklet which became known as the "Use Book" and preceded the numerous volumes of later years. He also wrote "The Training of a Forester," a popular "The Use of the National Forests," "The Fight for Conservation," and a "Primer of Forestry". Another pioneer accomplishment was making the first study and forest policy recommendations ((in 1902)) for the Philippines, then only recently acquired by the United States from Spain in the war of 1898.

Henry S. Graves (1871-1951). Second Chief of the Forest Service (1910-20), and Dean, Yale Forest School (1900-10 and 1922-39). He was a Yale classmate in the late 1880s of Pinchot, who persuaded him to turn from chemistry to forestry, thus becoming the second American to make forestry his career. Graves took a forestry course at Harvard as the first student, and also spent a year studying the subject at the University of Munich, Germany. In the mid-1890s he assisted Pinchot in private forestry consulting work, doing field work in making forest management plans for large landowners and forest industries, a service which both continued as a public service under special arrangements after Pinchot became Chief of the Division of Forestry in the U.S. Department of Agriculture in 1898. Graves then became the Assistant Chief, but left two years later to head Pinchot's new Yale Forest School. In 1906 Graves wrote the first American forestry textbook, "Forest Mensuration," and in 1911, "Principles of Handling Woodlands." In 1896 he had written with Pinchot the first comprehensive American scientific report on a single important tree species, "The White Pine".

Graves became Pinchot's successor as Chief of the Forest Service in 1910, partly through Pinchot's influence, and he strengthened and consolidated the enormous gains made under Pinchot and Roosevelt. He fought successfully, with some astute compromising where unavoidable, against strong efforts to weaken the National Forest System and to return the lands to the States. During his tenure, the Forest Products Laboratory was established at Madison, Wisc.; the Weeks Law was enacted (1911) allowing Federal purchase of forest lands deemed necessary to protect the flow of navigable streams and providing for Federal-State cooperation in forest fire protection; and the Research Branch of the Forest Service was organized. National Forests were started throughout the East. He began the drive which his successor, William B. Greeley, finished for broader Federal-State cooperation in forestry. Both as Dean and Chief he stressed efficient management for maximum growth on commercial forest lands. In 1917 in Franc he made the first plans for the American forestry regiment which provided lumber fo

From 1910 to 1912 Graves headed a committee which issued a report suggesting standards for forestry education, including four levels of instruction, from general elementary courses to advanced professional training. He co-authored a book on the subject in 1932, after taking part in another forestry education survey. After leaving the Forest Service for the second time in 1920 he was a private practicing forester for two years before resuming the Deanship of forestry at Yale; he also served as Provost at Yale from 1923 to 1927. He was an organizer, in 1900, and first vice-president of the Society of American Foresters, 1900-04, and president in 1912. He helped organize the forestry division of the Food and Agriculture Organization of the United Nations in 1944 and was chairman of the forestry advisory committee. He received several honorary degrees from Harvard, Yale, and Syracuse Universities, as well as distinguished forestry awards.

William B. Greeley (1879-1955). Third Chief of the Forest Service (1920-28) and the first from the West (California), he was largely responsible for the very great advance in nationwide forest management and conservation of the 1920s, through his very effective efforts in enlisting the active cooperation of logging and lumber companies with the States and the Federal Government, particularly in fire control but also in reforestation and more equitable State and local tax policies. Greeley served the Forest Service for 24 years (1904-28). He worked out some of the first cooperative fire-fighting agreements with States and large private forest landowners in the West, and helped set up several private timberland protective associations for fire control, while in charge of the Northern Rocky Mountain District.

His experience both in the field and in the Washington headquarters, especially a special study he made for the Forest Service, and the report he wrote, gave him an understanding of the powerful economic reasons behind the heavy cutting practices of logging companies of the late 1800s and early 1900s, and made him rely on Federal aid to States in fire control, reforestation, research, and taxation studies--as exemplified in the Clarke-McNary Act of 1924 and the McSweeney-McNary Act of 1928, for which he was largely responsible--rather than severe restrictions on private timber harvesting. He had a cautious policy on timber cutting regulations on private land, (like Graves) urging that it be left to the States rather than the Federal Government, as the only practical way, though slow. He broke with his mentor, Gifford Pinchot, on this major issue. (The major western timber States and others eventually did pass such laws.) The Clarke-McNary Act also extended Federal authority to purchase lands for timber production.

Under Greeley's guidance, National Forest administration was further improved, and the Forests in the East and South were expanded. State and industrial forestry made great strides under his encouragement. For many years Greeley played a leading part, along with his assistant, Edward E. Carter, in developing National Forest timber management policy. During World War 1 he spent two years supervising an American forestry engineers regiment in France which operated 95 sawmills to provide lumber for the needs of the Allied armies.

By 1928 Greeley felt that he had accomplished his major public service obligations to American forestry, so he accepted the offer to be secretary of the West Coast Lumberman's Association. He had refused some earlier offers, including that of Dean of Forestry at the University of California, his undergraduate alma mater. He remained in this position for 18 years, retiring in 1946 to do considerable writing and speaking on forestry. His book, "Forests and Men," published in 1951, is his personal account of the period of the forest conservation movement in America in which he took such an active and decisive part. He also wrote "Forest Policy" in 1953.

Robert Y. Stuart (1883-1933). Under his leadership as Chief (1928-33), which included the deepest days of the Great Depression, there began, during Stuart's last year in office in 1933, with the New Deal administration of Franklin Roosevelt, a sudden and great expansion of Forest Service responsibilities. The widespread rural unemployment was somewhat relieved by the millions of dollars funneled into national and state park and forest construction and improvement projects--roads, trails, fire towers, picnic and campsite facilities, bridges, fire-fighting, tree-planting, tree-thinning, etc., under the Emergency Conservation Works program and its successor, the Civilian Conservation Corps program. Hundreds of these camps were run by the Army in cooperation with the Forest Service, and the hundreds of thousands of young men recruited under Forest Service and other resource agency supervision provided greatly improved and expanded fire protection, reforestation, and public recreation facilities which proved of rich benefit to the Nation as well as to themselves. Stuart directed the tremendous pioneering task of planning and organizing this vast program in a very short period of time. The ECW program was authorized by the Unemployment Relief Act passed on March 31. On April 10 the first quota of 25,000 men was called, and a week later the first camp, Camp Roosevelt in the George Washington National Forest in the Blue Ridge Mountains of Virginia, was opened.

During his period as Chief, large cutover and farmed-out acreages were purchased in the mountains of the Southeast and the sand flats of the Great Lakes and turned into many new National Forests. Millions of acres of burned-over, denuded, and badly eroded lands in these regions were planted to trees, as large new nurseries were established under the Knutson-Vandenberg Act. There was also a big expansion in Federal-State forestry cooperation and in forest research under the McSweeney-McNary Act. Stuart believed in relying upon example and cooperation in spreading good forestry practices to State and private lands. He was a very conscientious worker and put in long hours. He did much to stimulate tree planting, especially in the South, where the Stuart Nursery in Louisiana was named for him. He established experimental forests and natural areas for scientific study in 1933 shortly before he died in office, and the Forest Service began to greatly expand its Wilderness and Primitive Areas.

Stuart joined the Forest Service in 1906 just after receiving his master's degree from the new Yale Forest School, and worked in the West before coming to the Washington headquarters in 1912. Like Graves and Greeley, he served briefly in the forestry regiment in France during World War 1. He served as Deputy Forest Commissioner in Pennsylvania under Commissioner Gifford Pinchot (1922) and Secretary of the new Department of Forests and Waters under Governor Pinchot, before returning to the Forest Service to succeed William Greeley as Chief in 1928.

Ferdinand A. Silcox (1882-1939), served as Chief from 1933 to 1939. Like Stuart and Greeley, he was a graduate of Yale Forest School (1905), and thus was the fifth Chief in a row to have a close association with that school. He joined the Forest Service the next year, at first in Colorado and then in Montana. From 1911 to 1917 he was its chief forester for the northern Rockies, succeeding Greeley. He showed a talent for dealing with people in difficult situations, at first with his handling of homestead, mining, and grazing violations in Colorado. He took a major early part in organizing the administration of the National Forests at the regional level, and instituted more efficient timber cruising and fire control. After successfully mediating a big lumber workers' strike in the Northwest he helped select officers for the U.S. World War 1 forestry regiment in France, and (the Government used) his mediation abilities (to settle labor troubles in Seattle shipyards, and his organization talent to help reorganize the U.S. Employment Service. He then went into labor relations for the printing industry. He was brought back to head the Forest Service during the first term of the second President Roosevelt by Rexford Tugwell, a top Presidential advisor.

Silcox reorganized the agency in 1935 for greater efficiency, and supported imposition of the "10 a.m. rule" for maximum effort to control fires by 10 a.m. of the day following discovery. He renewed the fight that Gifford Pinchot had started, to bring about public regulation of timber cutting on private lands, (through Federal guidance but with State laws,) as part of the "second crusade" for forest conservation. Although he was largely unsuccessful in this effort, (at the time,) he did get the lumber industry to agree to a conservation amendment to the national lumber code of practice under the short-lived National Recovery Act of 1934, and State regulation (become widespread. did late in major timber States)

Silcox emphasized the prime importance for forestry to serve the public welfare, and for (the) Forest Service to allow local people a voice in making decisions that affect them, a theme that was to be greatly strengthened 35 years later.

He supervised the tremendous expansion in forest conservation work made possible by the Emergency Conservation Work and Civilian Conservation Corps relief programs during the Great Depression. During his term the CCC grew to full size and in 9 years of existence it enrolled more than 2 million young unemployed men, greatly advancing forestry nationwide. He tried to have it made permanent, stressing both the public benefit in conservation, and the benefit in physical and mental health of enrollees and their understanding of conservation.

Silcox also supervised the vast timber salvage project in New England conducted under the direction of the Forest Service after the great hurricane of 1938, in which it was estimated that 86 percent of the recoverable downed timber was salvaged and put to good use. During his term also, the Prairie States Forestry Project grew until 217 million trees in 16,000 miles of Shelterbelts were (selected, produced and) planted on 33,000 Plains and Prairie farms under supervision of the Forest Service.

In this period the Forest Service also completed its study of grazing on the much-abused western public rangelands, which recommended practices for improvement that were later carried out. Forested watersheds were surveyed for flood control through restoration and proper management of forests.

Silcox, like Stuart before him, drove himself hard. He succumbed to a second heart attack in December 1939, dying in office as had Stuart.

Earle H. Clapp (1878-1970). Served as Acting Chief from the end of 1939 to the beginning of 1943, in effect as Chief in all but name. He had organized the Forest Service's Bureau of Research in 1915 and supervised its research work for 20 years before becoming Associate Chief in 1935, and in that position had continued to direct, organize and strengthen it. He set up the nationwide network of Federal forest experiment stations. In 1926 he compiled "A National Program of Forest Research" for a special committee of the Society of American Foresters (SAF), which was the basis for the landmark McSweeney-McNary Act of 1928 which established Forest Service on a firm, scientific footing under central direction independent of the National Forestx System. He began the important periodic (nationwide) timber appraisals back in the early 1920s with the Capper Report, and wrote the plans used to conduct the 1945-47 survey (just before he reti

A tireless and meticulous worker, Clapp closely supervised preparation of three other momentous and exhaustive scholarly reports: "National Plan for American Forestry" (the so-called Copeland Report, 1933); "The Western Range" (1936), and "Forest Lands of the United States" (the Bankhead Report, 1941). The Copeland Report was the most comprehensive up to that time on the forest situation in America, showing that cutting was far ahead of growth on private lands and that the quality of timber in these stands was declining. The range report showed the terrible deterioration of public grazing lands, and the urgent need of Federal action to help these lands recover their natural productivity. The Bankhead Report pointed to the great role that good forest management could play in strengthening the Nation's economy and rural life.

Like Silcox, Clapp believed that Federal and State forestry should help solve social and economic problems, and serve human needs. He saw landownership as a responsibility to maintain the condition and productivity of the land, rather than exploit and exhaust it. He was a determined advocate of Gifford Pinchot's philosophy of strong Federal regulation of timber harvesting methods on private forestlands, a policy that was never implemented because of implacable opposition by the timber industry. He tried to have the area of public forests doubled, without success.

Clapp anticipated the ambitious Shelterbelt project in the Great Plains in a speech in 1928 to the Society of American Foresters, helped organize it and watched its progress under Forest Service direction with great interest. He had a large part in establishing the Civilian Conservation Corps, and was influential in obtain much other legislation, including the Flood Control Act of 1936 and the important role the Forest Service was given under it.

He fought openly against Henry Ickes' repeated attempts to return the National Forests to the Department of the Interior, together with the Forest Service. He gained thereby the disfavor of Franklin Roosevelt, who refused to approve his appointment as Chief and who eventually forced him out as Acting Chief, although Clapp remained on in his former post of Associate Chief.

As he assumed its leadership, the Forest Service was helping to mobilize the Nation's forest resources for World War 2. Cutting of National Forest timber was stepped up, including Sitka spruce in Alaska for aircraft; extensive surveys were made of production, supplies, and needs for wood products; special studies and tests were made for the armed forces, and forest lookout statinns were manned along both East and West Coasts as part of the year-round aircraft warning system. The Forest Service organized the emergency guayule rubber project, which was in full production at war's end.

Clapp served almost 40 years in the Forest Service, entering in 1905 after graduating in forestry from the University of Michigan. He attended the country's first 4-year forestry school at Cornell until that school was closed down in 1903. He received an honorary PhD from his alma mater in1928. After his retirement in 1945, he remained a leading figure in national and international forestry matters. In 1960 he was awarded SAF's Gifford Pinchot medal for outstanding service to forestry. He also received foreign awards.

Lyle F. Watts (1890-1962). He came to head the agency after serving as chief forester for the Pacific Northwest Region, where he had also given assistance to the Department of Agriculture in farm labor matters and in postwar planning. He was Chief during the war and postwar periods, from January 1943 to July 1952. Under his direction special wartime activities were expanded and then terminated. Management plans for the National Forests were intensified and under the great increase in wartime demands, harvesting of overmature timber in the Far West was accelerated.

Watts continued Clapp's strong effort for Federal regulation of timber cutting practices on private lands. Although several more States passed restrictive cutting laws and Washington State's act was affirmed by the State Supreme Court, no Federal law was enacted on this matter, as industry opposition continued. However, cooperators under the Timber Production War Project had to observe good practices to receive help. Meanwhile management of industrial forestlands improved.

Watts encouraged the expansion of Federal responsibility for furnishing funds and technical assistance through cooperation with the States and private forest industry--in the fields of forest fire protection and prevention, tree planting, woodland management and harvesting, wood-product marketing and processing, grazing management, pest control, forest timber surveys, etc., Various acts of Congress and amendments strengthened and extended these programs. The major new acts were the Sustained Yield-Forest Management Act of 1944 (which provided for cooperative Federal-private owner sustained-yield management forest units to support local community economies); the Forest Pest Control Act of 1947, and the Cooperative Forest Management Act of 1950.

As chairman of the forestry advisory committee to the Food and Agriculture Organization of the United Nations, he helped decisively to organize the Forestry Division of FAO. He began the planning and organizing work for the major Timber Resource Review, a comprehensive reappraisal of forest conditions and timber volumes in the U.S. on all classes of ownership, early in 1952 shortly before his retirement.

Watts joined the Forest Service in 1913 just after graduating in forestry from Iowa State College; he later received his master's and an honorary doctor's degree from that school. In 1928-29 he organized the new School of Forestry at Utah Agricultural College, and was its first head.

8/10/45

BERNHARD EDUARD FERNOW

DR. BERHNARD EDUARD FERNOW has been variously called "true pioneer of American forestry," "the driving force of American forestry" and "master builder of forestry." He came to America in 1876 from Prussia where he had served for six years in the Prussian forestry department. Ten years later with his appointment as Chief of the Division of Forestry in the Department of Agriculture, he became the first trained forester to direct governmental forest work in America.

During his 12 years in the Department, Dr. Fernow laid the foundation upon which the present organization of the Forest Service has been built. He was instrumental in securing the enactment in 1891 of the law which authorized the creation of the Federal forest reserves from the public domain. He is said to have also drawn up the act (not passed until 1905) providing for the administration of the forest reserves by technically trained foresters. Dr. Fernow initiated the technical study of wood utilization and research into timber physics and allied projects which lead to the founding of the Forest Products Laboratory. The forest plantations on the sandhills of Nebraska are also results of his efforts.

At the Massachusetts Agricultural College, Dr. Fernow presented the first course of forestry lectures delivered to collegiate students in America. When he left the Department in 1898, he went to Cornell University to organize the first American collegiate forest school. Nine years later he established Canada's first school of forestry.

Through his far-sighted ideas and unremitting work, Dr. Fernow laid the basis for popular understanding of the forest needs of the United States and the public sentiment which has made possible every successive development in public forest policies. His influence was felt in practically every State forestry law enacted in his time. He was a publicist and lecturer, as well as a prolific writer. He was an important factor in the founding of the American Forestry Association and rendered invaluable service toward creating a profession of trained men to carry on the forestry work of the nation.

Mary P. Edgerton

BERNHARD FERNOW - "True Pioneer of American Forestry".
First trained forester to direct governmental forest work in America.
Called also "The Driving Force of Forestry in America."
Called also "Master Builder in Forestry."

Born, January 7, 1851, in Inowraclaw, Province of Posen, Prussia, Germany.
Died, February 6, 1923, at Toronto, Canada.

Chief, Division of Forestry, U. S. Department of Agriculture, 1886 to 1898, inclusive.

Received his early training at the gymnasium at Bromberg, and entered the profession of forestry, following the prescribed courses for government service at Muenden Forest Academy.

He came to the United States in 1876, and at first practiced his profession as consulting forest engineer, the first in America.

He was prominent in establishing the American Forestry Association and from 1885 to 1898 he acted as its secretary and chief source of inspiration.

His work attracted the attention of President Cleveland, who appointed him Chief of the Division of Forestry of the U. S. Department of Agriculture to succeed Mr. Eggleston in 1886, March 15.

As Chief of the Division of Forestry, U. S. D. A., and Secretary-Editor of the American Forestry Association, he was very influential in the passage of that great piece of forest legislation, the law of 1891, authorizing the President of the United States to establish National Forests.

His work as Chief of the Division of Forestry was along six important lines of action:

1. The spread of forestry information among the people.
2. Encouragement of forestry legislation by States and nation.
3. Gathering of reliable information regarding our trees and forests.
4. Experiments to determine the technical properties of our principal species of timber.
5. Stimulation of tree planting on the plains.
6. Education of college students in forestry as a science and industry.

With unusual capacity for work, almost single-handed and under the most discouraging conditions of money and equipment, he started the great work for forestry conservation which has spread throughout the country.

BERNHARD EDUARD FERNOW (continued)

The year after he took charge of the Division of Forestry (1887) he delivered the first course of technical forest lectures presented to a body of students in America. This was at the Massachusetts Agricultural College. He afterward lectured similarly in Nebraska, Colorado, Wisconsin, and California.

In 1898, he organized the first collegiate forest school in America at Cornell University, which school he directed until 1903.

In 1906 he established the forestry school at Pennsylvania State College, as a Department of the School of Agriculture.

In 1907, he organized the first forest school in Canada, at the University of Toronto, and directed it until his retirement in 1920 as Professor Emeritus in Forestry.

Between 1870 and the retirement of Dr. Fernow from the direction of the Division of Forestry, U. S. D. A., in 1898, more than 150 measures for forestry were introduced in the National Congress.

He was the author of several hundred reports, bulletins, lectures, articles, and other writings on forestry and related subjects, and of two standard textbooks. He founded, edited, and published the "Forestry Quarterly" for 14 years, and became editor in chief of "The Journal of Forestry" when it superseded the Quarterly as the official organ of the Society of American Foresters.*

It may be truthfully be said of him, as has been said, that "he was the man who established American forestry on a firm and enduring foundation by hard work and sane work during formative ~~xxxxxxxxxxxxxx~~/years. He planted the tree and tended it till it had taken vigorous root.

*In 1917 the "Forestry Quarterly" was consolidated with the "Proceedings of the Society of American Foresters."

Dr. Bernhard Eduard Fernow. b. in Prussia
1851, the son of a high government official
Studied forestry at the Forst Academy at Munden
Fr. left years in Prussian Forestry Dept.
Visited U.S. in 1876, and became the
Chief of Forestry Division in 1886.
During his administration basis was
laid for development of forestry in U.S.
Organized first college of forestry at Cornell
University.

Dan Hoover CDD

Fernow

BERNHARD EDUARD FERNOW

Chief: 1886-1898
Born: Jan. 7, 1851 Inowraclaw ~~Ironclaw~~, Province Posen, Prussia
Died: Feb 6, 1923 Toronto, Canada

A fortuitous combination of events ~~#####~~ brought the unique talents of Bernhard Fernow, America's first professionally trained forester to the United States.

Variously called the "True Pioneer of American Forestry", "The Master Builder in Forestry","The Driving Force of Forestry in America", Fernow was born January 7, 1851, in the Ironclaw, Province of Posen, in Prussia. Born into ~~###~~ a family of landed German aristocracy,Fernow was a product of the 2nd of his fathers three marriages, each marriage having produced several children. Despite considerable family wealth, their very number required the children of Fernow's father, Ernst Leopold Ferno, to exercise a certain amount of self-suffienciency in staking out their respective futures.

Fernow was fortunate in that his enthusiasm for Forestry and Agriculture as a youth was of interest to his uncle, the administrator of the family estate. His uncle, being childless, desired an able blood relation ~~##~~ to care for the estate after his death.

Fernow acquired, as a youth, the requisite farming, breeding and livestock knowledge to manage the estate. But, to assume eventual tenureship, as administrator, he was required to gain a professional eduaation in both law and forestry.

His forestry studies were begun in 1869, at the age of 19, after graduation from the gymnasium at Bromberg. Entrance to the prestigous forest academy at Muenden, in the Western part of Prussia, in the Province of Hanover, followed successful completion of an examination and a years work in the woods under forest department guidance. His studies at Muenden were interrupted by a years service as a Lieutenant in the Franco-Prussian War, and the following year spent as a law student at the University of Konigsberg.

Upon completion of his studies at Muenden, Fernow immediately began forestry work. And, but for the intrudance of fate, might have lived out his days practicing forestry in his homeland where forestry was a well established, and respected profession.

Fate appeared in the form of Olivia Reynolds; an American girl, tending house for her brother, a student at the University of ######## Gottingen. The two were introduced-# She, to give Fernow English lessons. Soon, despite the disapproval of Fernow's family, the young couple became en#gaged. Following the engagement, Olivia,####in 1876 left with her brother for the United States. Fernow, much to the dismay of his family, followed her the same year.

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On June 20, 1879, the two were married by Dr. Henry Ward Beecher, the well know Pastor of Plymouth Congressional Church. Five children were to result from this union. Thus, America's first prof#essional forester arrived in the United States.

Fernow quickly found that forestry was an alien concept in the United States. He was required to #### work at a variety of jobs: clerk in a New York law office, giving private German lessons, bookeeping for a hardware firm- all the while promoting his services as a "consulting forest engineer."

It was in 1878 that Fernow became a#### associate of the########## American Instutute of Mining Engineers under the auspices of Rossiter W. Raymond, a friend# of his wife's family and secretary of the Institute. The Institute's interest in forests as a source of supply for charcoal to feed foundry furnaces provided forester #Fernow with a limited forum to exercise his training as a Forest Engineer. He addressed the Institute on such matters as the "advantages of red charcoal over black charcoal from the standpoint of fuel saving for blast furnace work." In 1878, he also discovered an electrical process for removing the tin coating from iron cans. A discovery he sought to market commercially but was unsucessful.

However, his association with Rossiter Raymond was fruitful. Raymond, long

associated with mining, both as a private consulting mining engineer and as United States Commissioner of Mines and Mining from 1868 to 1878, was also a keen observer of our public forest lands. During his often extensive travels West, to gather information for annual reports, Raymond viewed and wrote of the destruction of much valuable timber in the mining districts of the West and warned of the necessity of protecting western forest lands.

From Raymond, Fernow garnered much valuable data on western forest lands. Raymond also enabled Fernow to obtain a job with Cooper, Hewitt and Co. Abraham S. Hewitt President of the American Institute of Mining Engineers, U.S. Congressman, eventual Mayor of New York city and politician of reformist persuasion, took an interest in Fernow. He encouraged Fernow's forestry activities and was a powerful ally in his later endeavors.

Fernow, as an employee of Cooper, Hewitt and Co., was put in charge of a furnace on the Lehight river, in East-Central Pennsylvania. An Adjacent, 15,000 acre forest, supplied wood for the making of charcoal. It was on the Lehigh, in the Blue Mountains of Pennsylvania, that Fernow began to study, first hand, American forest conditions. The results of his studies were published in the American Journal of Mining and a periodical publication of the Association of Charcoal and Iron Workers whose editors were early advocates of forest conservation. From his own observations and through study of such documents as Henry Brewer's, 1870 Census of American Forests, Charles Sprague Sargent's 1880 Report on the Forests of North America, Fernow became alarmed at the rapid and un-necessary diminuation of American forest resources. He argued for protective legislation to protect wood-lands for future generations and for "economical management of these gifts"(of nature).

Fernow's outspokeness soon brought him to the attention of resource minded people, running the gamut from preservationists, or the so called denudits of that era, to the wholesale resource exploiters. Fernow saw the need for an objective viewpoint: that of a professional forester. He abhored waste but advocated scientific forest management.

In 1883, Fernow became a U.S. citizen. He also was named corresponding secretary of the American Forestry Association; a position he held until 1888, when he became chairman of the executive committee. Members of the American Forestry Association were instrumental in establishing the first American Forestry Congress in 1882 at Cincinatti. This Congress and subsequent annual congresses acted as symposiums for the dissemination of forest knowledge. They helped to establish forestry as an organized movement in the U.S., creating an impetus for forest legislation in state and federal government.

Fernow's intention, from the very start, was to promote scientific forest management among those attending the Congresses. Professional forestry was conceived by many to be merely an extension of tree planting, tree and watershed protection efforts and arbor day rites. His first paper, "Historical Sketches of the Development of the Forest Policy in Germany," traced one country's evolution from verdure, to senseless waste, to economic utilization of remaining forest reserves via a system of scientific forest management. The paper appealed to the "Patriots" disregarding the "preservation of America's forests". His next paper on "Conditions of Forest Growth" delivered in Montreal, was more specific offering basic principles underlying forest growth and general rules for forest management.

Fernow's work with the Forestry Congress, his work in drafting legislation for the administration of New York state forest preserve lands and his help in organizing the New York State Forestry Association (assisted by his employer Abraham Hewitt) brought Fernow a modicum of national attention.

In 1886, President Grover Cleveland, a former governor of New York state, consulted Abraham Hewitt on prospects to head the still embryonic forestry division of the Department of Agriculture. Despite his republican political background, Fernow's burgeoning reputation, coupled with Hewitt's recommendation secured him the appointment. He assumed the duties of Chief March 15, 1886, a

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republican in a democratic administration, another indicator of his increasing prominance in the forestry movement.

Required to retain his predecessor Nathaniel H. Egleston "a reverend, white haired gentleman", and feeling that the post called more for a politician then a forester, Fernow nevertheless served as Chief of the Division until 1898.

Handicappped by limited funds-ab ~~acorioratuib~~ AN APPROPRIATION of 10,000 dollars annually, the first four years and never more then 33,520 dollars thereafter-the far-seeing Fernow did much to lay the foundation of the present day forest service. Under his aegis ~~the forestry~~ a widespread and effective campaign to educate the public to the need for forest conservation was mounted. A major portion of his over 200 articles, addresses, monographs, over 50 circulars and bulletins were prepared during this period. They lay the groundwork for scientific forestry in the United States. His "timber Physics" research program involved scientific study of wood and forest growth . ~~The engineering~~ The sciences of engineering, chemistry, physics, botany, soil research (in itself, a new and controversial field), and forestry were to be drawn upon to evolve maximum economy and function in the growth and utilization of wood. Tree planting experiments, conducted in the plains stated by the division to alter climatic conditions for agricultural purposes were another indicator of Fernow's continuing efforts to establish forestry on a scientific basis.

Fernow's most enduring legacy and basis for today's national forest system was the Forest Reserve Act of 1891 authorizing the creation of forest reserves from the public domain. Impetus for the act was created by th Hale bill introduced in Congress January,1888. The Bill drafted by Fernow provided for both the establishment and management of forest reservation under a commissioner of forest in the Department of Interior. Despite considerable pressure for passage of the bill (much of it generated by Fernow) congressional opposition prevented enactment. The Forest Reserves Act, a last minute rider attached to a bill revising land laws, was a compromise providing only for

Presidential authority to set aside forest reserves on the the public domain but did not provide for professional management. By 1898, Fernow was able to see the basic provisions of the Hale Bill become fact. The federal forest reserve policy was firmly established by the Forest Reserve Act. And, under authority of yet another rider, passed June 4, 1897, the General Land Office of the Interior Department issued rules and regulations by which the reservations were to be managed. This act of June 4, with later amendments, is the one under which the National Forests are now being administered the Forest Service, U.S. Department of Agriculture.

Fernow left the Forestry Division in 1898 to organize the New York State College of Forestry at Cornell University. The first college level , school of forestry, Cornell listed among its students such later notables in the forestry field as Philip Ayres, Raphael Zon, Clyde Leavitt and Ralph C. Bryant. Ironically the school was closed in 1903 due to dispute over the 30,000 acre demonstration and experimental forest maintained by the college. Fernow's intention was to use the Forest, demonstrating the practicality of scientific forest management. His intentions were anathema to many misguided forest enthusiasts, who equated use (cutting) with desecration. Critiziam by wealthy home owners, unhappy over commercial lumbering in the area, led to further controversy. The result was a veto of approprations for the forestry school by the Governor. While at Cornell , Fernow found time to publish his Economics of Forestry. He also started the Forest Quarterly, later to become the Journal of Foresry and at the time, the only technical forestry journal in the country. Fernow was a consistent supporter of forestry education , citing the need for professionally trained foresters to impement and maintain forest reserves. He delivered the first lecture course in technical forestry in the United States at the Massachusetts Agricultural College in 1887.

The four years following his departure from Cornell, Fernow worked as a consulting forester. His work took him to Canada and Mexico. In 1907, he was invited to organize a department of forestry at Pennsylvania State College. Having laid the framework for the forestry department at the Pennsylvania

college, Fernow was similarly invited, later in the year, to establish and administer a school of forestry at the University of Toronto.

For the next twelve years, until his retirement as Professor Emeritus in 1919, Fernow served as dean of the forestry department. While at Toronto he published his "History of Forestry" and "Care of Trees in Lawn and Street". He was a member of the Conservation Commission of Canada for whom he conducted field surveys. He helped organize and was the first president of the Canadian Society of Forest Engineers. He, in short, thoroughly immersed himself in Canadian forestry matters, heralding, in the process, an increased awareness of forestry in Canada. Always fully up to date and in touch with United States forestry, Fernow, in 1916, was elected president of the American professional organization, the Society of Foresters.

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Fernow's last years in retirement were spent in writing and correspondence. A host of honors and recognition were conferred upon him.

Our first professional forester, Bernhard Fernow, passed away February 25, 1923 but this "true pioneer of American Forestry" lived to see his profession take root in the consciousness of a new land.

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1879 - ? Brown joined the iron
mfg. firm of Cooper, Hewitt & Co. of N.Y.
owners of iron works in New Jersey
He wrote article + papers on a large
Order.

1880 A forest at Lexington & Slate
on the Lehigh River. Site of Lehi
Furnace? The co. Henry Clepper says there
No evidence he did any forest management
He managed the furnace, and
built a sawmill,

In 1882 he prepared a map of the
property on Lehigh Mtn. near Lehigh Ga
with a description of the timbered land
farming land. Left for New York
in 1883, remained in charge of the
forest property until 1887,

He observed eastern forest condition
there - reproduction + management, noi
that chestnut was crowding out whiteoaks
hickories because of superior sprouting
stumps. Advised cutting only trees or branch
& sprouts that have no other use.

He told the Charcoal Iron Workers
Assn. they could show th
public the advantages of well regulated
management of their timber resources,
esp. that of Coppice (stump sprouts
and need to protect from fire & grazing
He conceded that forestry would not as ye
yield a profit on private lands enough
to stop deforestation. Legislation is
needed to restrict the disposal of woodlan

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699 D3 43

What is urban forestry?

Although the term "urban forestry" means different things to different people, the Forest Service considers urban forestry as an umbrella concept that encompasses the planning and management of all urban forest resources for their present and potential contribution to the physical, social, and economic well being of urban society.

How is the Forest Service involved?

Under the Cooperative Forestry Assistance Act of 1978 the Secretary of Agriculture is assigned the Federal role in "planning and conduct of urban forestry programs." Through the Urban Forestry Assistance section of the Act, the Forest Service provides financial, technical, and related assistance to cooperating State Forestry agencies.

What is the purpose of the program?

Nearly 80 percent of our country's population now lives in an urban environment. The Urban Forestry Assistance program is intended to establish, improve, protect, maintain, enhance, manage, and utilize urban forest resources because of their great economic and environmental value, and consequently to improve the quality of life in urban America.

How does the Urban Forestry Assistance program work?

Based on local needs, a program plan is prepared by the State Forester. Federal funds can then be made available to the State on a 50-50 matching basis. Technical assistance may be provided directly by competent State personnel or the funds can be made available to local governments, educational institutions, private or public organizations, and others through a subgrant provision.

What types of technical assistance are included?

PLANNING: Technical assistance maybe provided in urban forest resource planning including such activities as identifying local issues, needs and problems; establishing goals and objectives; organizing public involvement sessions; determining resource inventory needs; and developing management plans.

PLANTING: Technical assistance may be provided in tree planting including such activities as selecting species, preparing planting plans, and determining the proper timing and methods of planting and transplanting.

CARE AND MAINTENANCE: Technical assistance may be provided in the care and maintenance of urban forest resources including such activities as determining pruning or removal requirements and techniques; use of systemics, growth inhibitors and fertilizers; and in detecting, evaluating, preventing or suppressing insect, disease, and other pest damage.

UTILIZATION: Technical assistance may be provided in the utilization of urban forest resource by-products including such activities as determining the disposition of felled trees; marketing of logs, fuelwood, chips and other wood materials; and the recycling of wood waste as an energy source.

DEVELOPMENT: Technical assistance may be provided in protecting and managing or establishing urban forest resources during urban expansion and renewal including such activities as consulting with public authorities and developers in the identification of drainage patterns, design of fills and excavations, alleviation of compaction, erosion, and mechanical damage; and working with citizens groups and others in urban renewal or revitalization projects.

MULTIPLE USE MANAGEMENT: Technical assistance may be provided in multiple use management including such activities as determining existing and projected use of the urban forest to include such considerations as recreation, wildlife habitat, watershed values, wood and forage production, and visual resource management.

Who is involved?

Because urban forestry is an umbrella concept which encompasses a broad scope, many disciplines are actively involved. Such disciplines may include: urban planning, landscape architecture, horticulture, nursery management, arboriculture, entomology, hydrology, pathology, forestry, wood products utilization, wildlife biology, recreation management, soil science, and sociology.

What about private enterprise?

Where appropriate services of private consultants, commercial arborists, and others involved in the horticulture and other related industries are available, such services may be utilized through referrals, contracts, or agreements to provide technical assistance. An objective of the urban forestry assistance program is to develop a better public awareness of the value of trees in an urban environment. Such awareness will stimulate work for private enterprise.

What is the role of the public?

Community citizens have a vital role in the management of urban forest resources. Only through extensive public involvement and participation, can urban foresry programs be successful in addressing local needs

Where is additional information available?

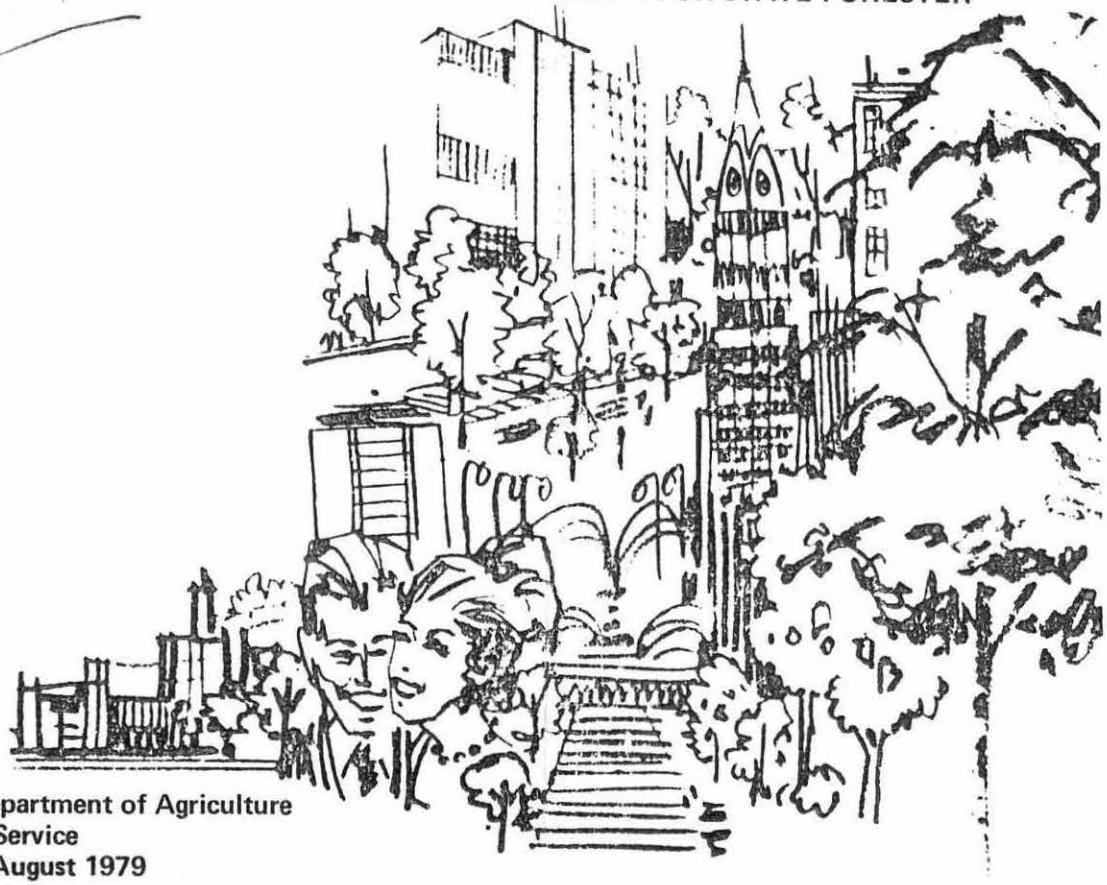
For further information regarding an urban forestry program for your community, contact your State Forester. ●

Fermor's gt. gr. dau. in urban forestry in Cheyenne, Wyo. 1980

Those involved in urban forestry share a common goal . . . to make our cities and communities a better place to live and work.

Urban Forestry Assistance

A COOPERATIVE PROGRAM OF THE USDA FOREST SERVICE AND YOUR STATE FORESTER



U.S. Department of Agriculture
Forest Service
Issued August 1979

Bernhard E. Fernow:

From Chas. Randall's article in Am. Forests, Apr. 1964; Steen's book.

1. From Sam Dana's Forest and Range Policy; Rodgers' biography; Clepper's Leaders of AmCo

At the same time Fernow was appointed Chief of Division, Congress gave it statutory recognition as a DIVISION, in June 1886. Altho a Republican, he was chosen by President Cleveland, a Democrat, since he was so obviously the most qualified man in the U.S He had become a citizen in Dec. 1883. He had emigrated in 1875 and married an American woman whom he had met in Germany. in 1879

A German, he was a graduate of the forestry school at Muenden and practiced forestry for the German government before leaving Germany.

He was employed for several years after coming to the U.S. supervising iron furnaces and 15,000 acres of hardwoods for Cooper, Hewitt and Co. of Pennsylvania, and wrote on forestry for Birkenbine's Journal of Charcoal Iron Workers.

He participated in the American Forestry Congress at Cncinnati in 1882 where he read a paperon forestry. He bdcame corresponding secretary of the Congress in 1883, executive committee chairman in 1888, its editor in 1885, and

The Division's wprk remained mostly gathering and publishing information, but its research became more professional. He began work in timber physics which included the composition and properties of wood, what influenced its structure, and its diseases and ddefects, especially in relation to major uses. He urged establishment of forest experiment stations, and began tree-planting Fernow wrote and spoke widely on forestry both for scientists and the general public. He emphasized forest management that would allow the forest to regenerate itself, both in papers delivered at meetings of the American Forestry Congress and the the American Forestr y Association with which it merged in 1882, and as Chief of teh Division of Forestry.

During the 12 years he headed the Division, he prepared over 200 articles, addresses and monographs, and over 50 circulars and bulletins which laid the groundwork for forestry in the United States, He supervised tree-planting experiments in the Great Plains, and strongly influenced political and educational leaders to encourage the practice of forestry. He published the first scientific studies on tree diseases in the US in 1887-

Fernow believed that forestry must justify itself commercially, but did not advocate leaving all the forests in the hands of private enterprise. He believed that some forest should be owned and managed by the Federal, State, and other governmental units, and that some supervision should be placed on forest exploitation by timber companies in order to assure continued supplies of wood for the future.

Fernow pressed for and took a major part indrafting legislation to establish the Adirondack Forest Reserve in New York State, in 1885, and the Federal Land Law Revision Act of 1891 which provided for setting asdde of forest reserves by the President the establishment and managenet of Federal forest reserves. His draft of 1888resulted in a provision of and to allow the President to establish Federal forest reserves in 1 Much of his provisions for managing the reserves originally contained in the Hale bill in 1888 were embodied in provisions of the Appropriation Act of 1897. However since the reserves were in the Department of the Interior, Fernow could not exercise supervision over them.

He left the Division of Forestry in 1898 to organize and direct the firstfour-year Professional school of forestry in the Americas, at Cornell University. This school was terminated in 1903 due to a dispute over clearcutting demonstrations in the Adirondacks. In 1904 demonstration forest he gave a series of lectures at the forest school at Yale University, set up in 1900. In 1907 he helped start and taught at the forest school at Pennsylvania State College, and organized the forest school at the University of Toronto which he headed until retirement in 1919.

Fernow started the Forestry Quarterly in 1902 and was its editor until it merged with the Proceedings of the Society of American Foresters and changed its name to the Journal Forestry, which he then edited until his death in 1923. He write three books: Economics Forestry (1902); A Brief History of Forestry (1913); and Care of Trees (1910).

Fernow was a vice-president of AAAS in 1895, president of the SAF in 1916, organizer and first president of the Canadian Society of Forest Engineers, and member of the Canadia Forestry Commission. He received honorary LLD degrees from three universities.

Upon his death the Journal of Forestry published an unprecedented series of tributes from many of the leading forestry professionals of the day. Former Chief Wm Greeley said began the science of silviculture, wood utilization, timber physicsin the U.S. His contrit tions to American forest literature was phenomenal in number, breadth and technical quali He played a large part in building a favorable public sentiment for forestry in the U.S. He influenced the passage of State laws establishing departments of Fore and protection of forests from fire. In 1895 he urged the House to p and forestry schools vide funds for land grant colleges to teach fo

44pp.